TECHNICAL MANUAL

OVERHAUL WITH PARTS BREAKDOWN

INDICATOR, TEMPERATURE, THERMOCOUPLE

MODEL 7430

(PART NUMBER 74-3-0-1)

MODEL 7440

(PART NUMBER 74-4-0-1)

SPACE CORP.
Contract No. F41608-72-C-5278
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Total number of pages in this manual is 74 consisting of the following:

Page Number	# Change Number
Title	2
A	2
i	2
ii blank	2
iii	2
iv blank	2
1-1 - 1-4	0
2-1/3-1 - 3-4	0
4-1/5-1 - 5-3	0
5-4 blank	0
6-1	1
6-2 blank	1
7-1 - 7-5	0
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7-14 blank	1
8-1 - 8-3	0
8-4 - 8-5	2
8-6 - 8-9	0
8-10	1
8-11 - 8-15	0
8-16	1
8-17 - 8-18	0
8-19 - 8-24	1
8-25 - 8-36	2
9-1 - 9-4	2

Zero in this column indicates an original page.

TABLE OF CONTENTS

Section		Page
LIST OF ILLUSTRATIONS		i/(ii blank)
INTRODUCTION		iii/(iv blank)
I.	GENERAL INFORMATION	1-1
	1-1 General	1-1
	1-3 Theory of Operation	1-1
II.	SPECIAL TOOLS AND TEST EQUIPMENT	2-1/3-1
III.	DISASSEMBLY	2-1/3-1
	3-1 Disassembly	2-1/3-1
IV.	CLEANING	4-1
	4-1 Cleaning	4-1
V.	INSPECTION, REPAIR AND REPLACEMENT	5-1
	5-1 Inspection	5-1
VI.	ASSEMBLY	6-1
	6-1 Assembly	6-1
VII.	TESTING	7-1
	7-1 Testing	7-1
	7-3 Calibration	7-1
VIII.	ILLUSTRATED PARTS BREAKDOWN	8-1
IX.	NUMERICAL INDEX	9-1

LIST OF ILLUSTRATIONS

No.	Title	Page
1-1	Instruments Face Description	1-2
1-3	Block Diagram, Model 7430	1-4
3-1	Top View, EGT Individual	3-2
3-2	Digital Indicator, Rear View	3-3
3-3	Digital Indicator Installed, Side View	3-4
3-4	Digital Indicator Circuit Boards	3-4
7-1	Test Points Digital A1 Circuit Board	7-2
7-2	Test Points Analog A2 Circuit Board	7-4
7-3	Wiring Diagram	7-7/(7-8 blank)
7-4	Digital A1 Circuit Board Schematic	7-9/(7-10 blank)
7-5	Analog Schematic Diagram	7-11/(7-12 blank)
7-6	Schematic Diagram, Analog	7-13/(7-14 blank)
8-1	Exhaust Gas Temperature Indicator (Sheet 1 of 2)	8-6
8-1	Exhaust Gas Temperature Indicator (Sheet 2 of 2)	8-7
8-2	Thermocouple Type K Indicator	8-9
8-3	Digital PC Board Assembly	8-11
8-4	Analog PC Board Assembly	8-14
8-5	Analog PC Board Assembly	8-19
8-6	Exhaust Gas Temperature Indicator, Model 7440	8-25
8-7	PC Board Assembly (A1), (A2)	8-27
8-8	Digital (A1) Board Assembly	8-29
8-9	Analog (A2) Board Assembly	8-32

LIST OF TABLES

No.	Title	Page
1-2	Leading Particulars	1-3
5-1	Inspection Details	4-1/5-1
5-2	Troubleshooting Chart	5-2

INTRODUCTION

INTRODUCTION.

This manual provides Overhaul Instructions with Illustrated Parts Breakdown for the EGT (Exhaust Gas Temperature) Indicator, Model 7430, manufactured by SPACE Corp., Dallas, Texas.

PURPOSE.

The EGT Indicator is a high speed, self-contained digital temperature indicator for measuring temperature in degrees Fahrenheit from a Type K, chromel alumel thermocouple input. The indicator is compatible with the A/F M37T-1, T-1A, A/M 37T-6, T-6A, T-6B, T-6C and T-16 Engine Test Stands for measurement of EGT (individual) temperatures. The indicator, however, may be used for any temperature measurement utilizing the referenced thermocouple.

SCOPE.

This technical manual is provided to assist overhaul maintenance personnel in troubleshooting, disassembly, cleaning, inspection, repair and replacement, assembly, and testing of the Model 7430 EGT Indicator. This technical manual also contains an Illustrated Parts Breakdown to aid in parts identification, requisitioning and replacement.

NOTE

In addition to the parts breakdown for the Model 7430 EGT (Type K) Indicator, this manual includes a parts breakdown of a Model 7440 (Type J) Indicator used to measure inlet air temperature. Due to the similarity of construction, many parts of the overhaul instructions are applicable.

8-23. CODE "X" - PARTS CONSIDERED IMPRACTICABLE FOR SERVICE MANUFACTURE.

a. Code "X" is applied to main structural members or similar parts, which, if required, would suggest extensive repair. The need for a part or parts coded "X" (wing spars, center section structure, etc.) should normally result in a recommendation to retire the article from service.
b. Code "XI" identifies parts applicable at any level of maintenance consistent with the command's authorized scope of maintenance, and for which procurement of the next higher assembly so coded "P1" is normally justified; for example, an integral detail part such as a welded segment inseparable from its assembly; a part machined in a matched set; or a part of an assembly which, if required, would suggest extensive reconditioning of the assembly. In some cases Code "XI" may be used to indicate an integral detail part of an assembly for which there is no anticipated usage and as an assembly was coded "M" or "M1".
c. Code "X1D" identifies parts described under the "X1" code but which are applicable to Air Force activities authorized depot-level maintenance only.
d. Code "X2" identifies parts applicable at any level of maintenance consistent with the command's authorized scope of maintenance, usage of which is not anticipated and which are impracticable for service manufacture. This type of item will not be stocked. Such parts shall be obtained from reclamation, or requisitioned through normal supply channels with supporting justification for one-time procurement and immediate issue. Repeated requests shall justify a change to a "P1" or "P2" code as applicable if considered economical to procure and stock such parts.
e. Code "X2D" identifies parts described under the "X2" code but which are applicable to Air Force activities authorized depot-level maintenance only. Repeated requests for such parts shall justify a change to a "P1D" or "P2D" code, as applicable, if considered economical and feasible to procure and stock such parts.

8-24. CODE "U" - PARTS NOT PROCURED, MANUFACTURED, OR STOCKED. Code "U" is applied to installation drawings, diagrams, instruction sheets, field-service drawing numbers, and parts not otherwise of supply significance, including obsolete parts, which cannot be procured or service manufactured.

8-25. CODES FOR PARTS KITS:

a. Code "F" - Minor or Field Parts Kit. Code "F" is applied to kits which are available to all maintenance activities authorized to perform base level repair of end item, including overhaul activities in support of field activities.

(1). Code "KF". Code "KF" is applied to items which are components of an F-Kit.

b. Code "D". Code "D" is applied to kits which are available only to thos activities authorized to perform depot level repair.

(1). Code "KD". Code "KD" is applied to items which are components of a D-Kit.
(2). Code "KB". Code "KB" is applied to items which are components of both an F-Kit and a D-Kit.

c. Items which are source coded "KD", "KF" or "KB". and for which the application of such items is peculiar to repair kits, will not be stocked separately and will not be assigned any additional source codes.
d. Items which are source coded "KD", "KF" or "KB", and for which the application of such items is common to repair kits and to other repair or overhaul application, will be stocked separately in the appropriate commodity class if followed by the letter "P".

8-26. MAINTENANCE REPAIR LEVEL CODE COLUMN. The following repair codes, assigned by the activity responsible for provisioning spare and replacement component parts, indicates the applicable organizational level of maintenance anr repair. (See paragraph

8-27. CODE "S" - NO REPAIR. Code "S" identifies items which are non repairable and have no reclamation value. When these items fail they will be disposed of at user level as condemned material.

8-28. CODE "B" - NO REPAIR: RECONDITION. Code "B" identifies assemblies or parts that will be reconditioned at the user level by adjusting, cleaning, soldering broken connection, etc. If these items cannot be returned to serviceable condition by such means they will be disposed of at user level as condemned material. No repair parts or tools are specially procured for maintenance of these items.

8-29. CODE "F" - FIELD LEVEL MAINTENANCE. Code "F" identifies items which will be repaired by the field level maintenance activities. Normal servicing will be done by organizational level maintenance. Selected parts, tools, and technical order data are procured and provided to applicable field level maintenance activities for repair of these items. No SRA is established for these items. If the condition of these items is such that they cannot be returned to serviceable condition by the field level maintenance activity with authorized parts and tools, they will be disposed of as condemned material. If repair of "F" coded items cannot be accomplished due to unavailability of authorized parts, tools, or other capability, the applicable SSM/IM will be so advised with request for disposition instructions. "F" coded critical items, regardless of condition, will be returned to supply for disposition instructions from the applicable SSM/IM.

8-30. CODE "D" - LIMITED FIELD REPAIR: DEPOT OVERHAUL. Code "D" identifies items on which a limited degree of repair can be accomplished by field level maintenance activities. Normal servicing will be done at organizational level. SRA is established for overhaul of these items. A range of repair parts, tools, and technical order data consistent with the capability of repair are procured and provided to applicable field maintenance activities.

Because of the design characteristics and complexity of repair, the degree of repair which is authorized on these items at field maintenance level is necessarily determined by the degree of technical skills required and the cost of special tools, special test equipment, spare parts, and the predicted frequency of failure generation. If these items cannot be returned to serviceable condition with authorized parts and tools they will be returned to supply for shipment to the designated SRA.

8-31. CODE "DM" - LIMITED FIELD REPAIR: MOBILE DEPOT OVERHAUL. Code "DM" identifies items to which all the conditions of Code "D" apply except that repair beyond field capability will be done by the Mobile Depot Activity (MDA). If the MDA cannot repair these items, disposition instructions will be requested from the IM.

8-32. CODE "L" - DEPOT LEVEL MAINTENANCE ONLY. Code "L" identifies items that will be repaired only at designated SRA. Repair parts and tools for repair are procured and provided only to these authorized activities. Required functional checkout and bench check equipment may be provided to applicable organizational and field level; maintenance activities for accomplishing external adjustment or calibration and for verifying serviceability of these items. If they are found unserviceable they will be turned in to supply for shipment to the SRA.

8-33. CODE "LM" - DEPOT LEVEL MAINTENANCE ONLY; MOBILE DEPOT ACTIVITY. Code "LM" identifies items to which all conditions of Code "L" apply except that repair will be accomplished by MDA. If MDA cannot repair these items, they will determine whether these items should be condemned or sent to the SRA.

VENDOR CODES

Code	Vendor's Name and Address
01295	Texas Instruments, Inc. Components Group P.O. Box 5012/13500 N Central Expwy Dallas, TX 75222
01686	RCL Electronics, Inc. 195 McGregor Street Manchester, NH 03102
04713	Motorola, Inc. Semiconductor Products Div. 5005 E. McDowell Road Phoenix, AZ 85008
04984	SPACE Corp. P.O. Box 402009 Garland, TX 75040
05397	Union Carbide Corp. Materials System Div. 11901 Madison Avenue Cleveland, OH 44101
06001	General Electric Company Electronic Capacitor Products Div. P.O. Box 1388 Columbus, SC 29202
07263	Fairchild Semiconductor - A Div. of Fairchild Camera & Instrument Corp. 466 Ellis Street Mountain View, CA 94040
07387	Birtcher Corp. The Medical Div. 4501 N. Arden Drive El Monte, CA 91734
08806	General Electric Company Miniature Lamp Department Nela Park Cleveland, OH 44112
13715	Fairchild Semiconductor - A Div. of Fairchild Camera & Instrument Corp. 4300 Redwood Highway San Rafael, CA 94903
14752	Electro Cube, Inc. 1710 S. Del Mar Avenue San Gabriel, CA 71776
15238	ITT Semiconductors - Div. of International Telephone & Telegraph Corp. 500 Broadway Lawrence, ME 01841
15801	Fenwal Electronics, Inc. 6300 Fountain Street Framingham, ME 01701
19701	Electra/Midland Corp. P.O. Box 760 Mineral Wells, TX 76067
27014	National Semi-Conductor Corp. 2950 San Ysidro Way Santa Clara, CA 95051
28480	Hewlett-Packard Company 1501 Page Mill Road Palo Alto, CA 94304

VENDOR CODES

Code	Vendor's Name and Address
31514	Standford Applied Engineering, Inc. Advanced Packaging Div. 3080 Airway Drive Costa Mesa, CA 92626
32873	Newport Electronics 630 East Young Street Santa Ana, CA 92705
32997	Bourns, Inc. Trimpot Products Div. 1200 Columbia Avenue Riverside, CA 92507
34333	Silicon General, Inc. 11651 Monarch Street Garden Grove, CA 92641
34553	Amperex Electronics Corp. Component Div. 35 Hoffman Avenue Hauppauge, NY 11787
46384	Pen Engineering and Mfg. Corp. P.O. Box 311 Doyletown, PA 18901
53021	Sangamo Weston, Inc. P.O. Box 3041 Sarasota, FL 33578
56289	Sprague Electric Co. North Adams, ME 01247
71400	Bussman Manufacturing Div. of McFraw-Edison Co. 2536 W. University Street St. Louis, MO 63017
72653	G.C. Electronics Company Div. of Hydrometals, Inc. 400 S. Wyman Street Rockford, IL 61101
72962	ESNA Div. of AMERACE CORP. 2330 Vauxhall Road Union, NJ 07083
73138	Bechman Instruments, Inc. Helipot Div. 2500 Harbor Boulevard Fullerton, CA 92634
75382	Kulka Electric Corp. 633-643 S. Fulton Avenue Mt. Vernon, NY 10550
75915	Littlefuse, Inc. 800 E. Northwest Highway Des Plaines, IL 60016
79963	Zierick Manufacturing Company Radio Circle Mt. Kosco, NY 10549
80031	Mepco/Electra, Inc. 22 Columbia Road Morristown, NJ 07960
81073	Grayhill, Inc. 561 Hillgrove Avenue La Grange, IL 60525
81349	Military Specifications, Promulgated by Military Department Agencies Under Authority of Defense Standardization Manual 4120 3M
83330	Herman H. Smith, Inc. 812 Snediker Avenue Brooklyn, NJ 11207
92194	Alpha Wire Corp. 711 Lidgerwood Avenue Elizabeth, NJ 07207
94222	Southco, Inc. Lester, Pennsylvania 19113
99800	American Precision Industries, Inc. Delevan Div./270 Quaker Road East Aurora, NY 14052

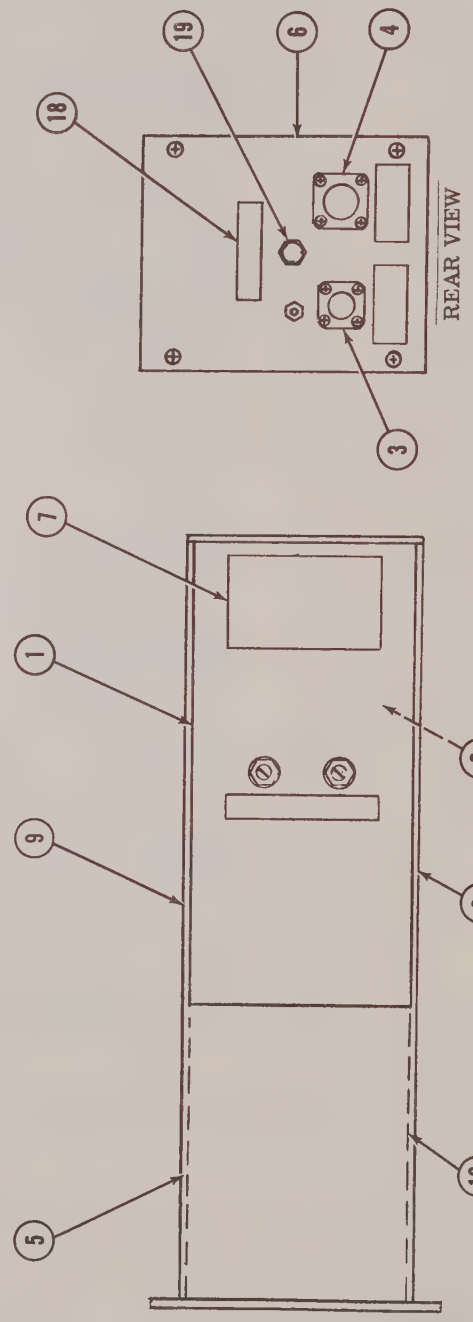

Figure 8-1. Exhaust Gas Temperature Indicator (Sheet 1 of 2).

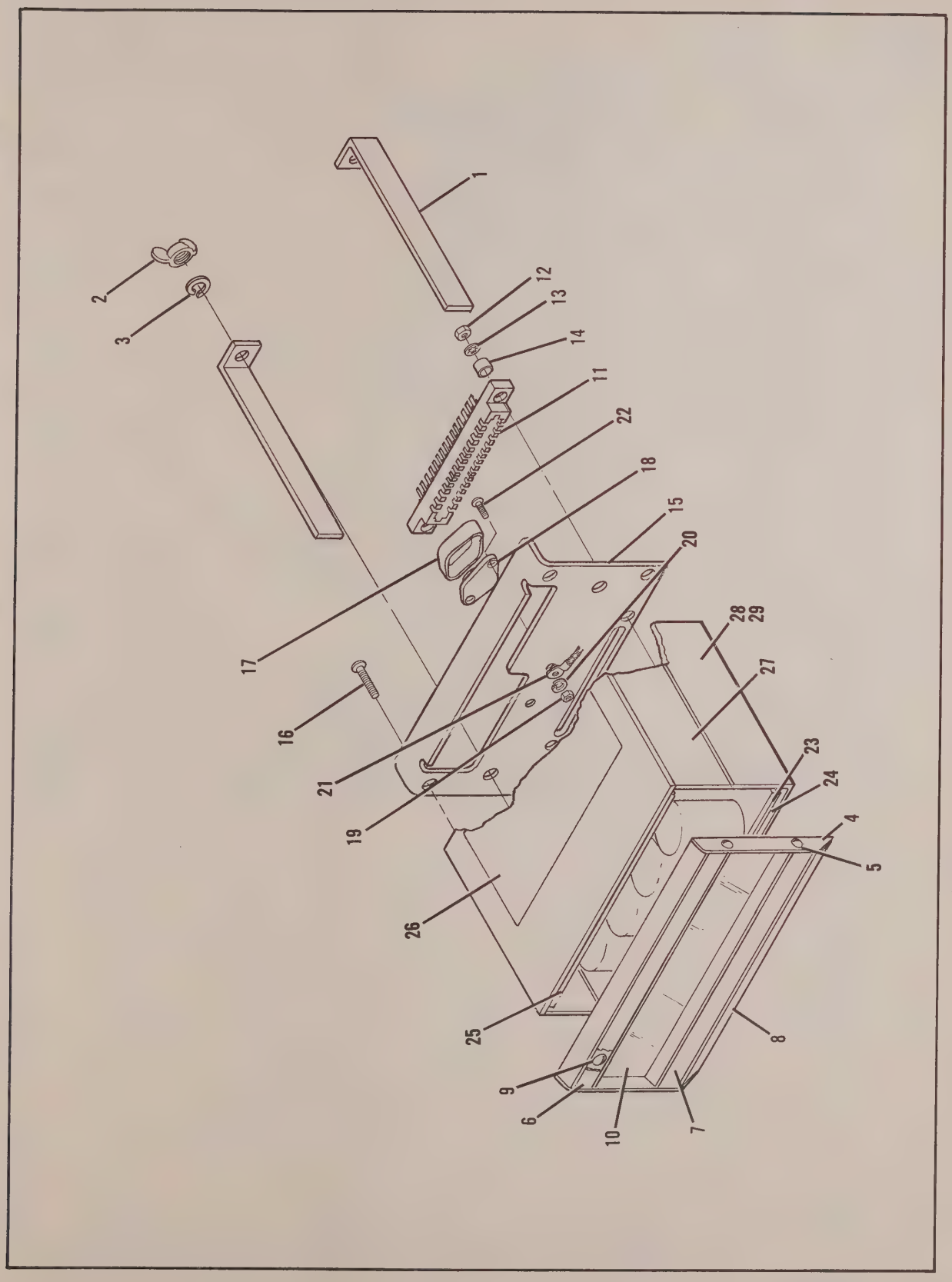

Figure 8-6. Exhaust Gas Temperature Indicator, Model 7440.

T.O. 33D4-6-456-3

FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	S M R
8-6-	SCD7440	INDICATOR,TEMP. (04984)	REF	PAFFFP
1	74-4-9-6	. BRACKET, MTG (04984)	2	XBFZZ-
		(ATTACHING PARTS)		
2	W440-3	. NUT,WING 8-32, STL (83385)	2	PAFZZN
3	MS35338-42	. WASHER,LOCK (96906)	2	PAFZZN
		---*---		
4	74-4-9-3	. END PLATE, (04984)	2	XBFZZ-
		(ATTACHING PARTS)		
5	MS51861-1C	. SCREW (96906)	4	PAFZZN
		---*---		
6	74-4-9-7	. NAME PLATE (04984)	1	XBFZZ-
7	74-4-9-8	. NAME PLATE (04984)	1	XBFZZ-
8	74-4-9-1	. PANEL,BEZEL (04984)	1	XBFZZ-
		(ATTACHING PARTS)		
9	MS35206-228	. SCREW (96906)	4	PAFZZN
		---*---		
10	74-4-9-4	. FILTER,POLAROID (04984)	1	PAFZZN
11	SCD10639	. CONNECTOR (04984)	1	PAFZZN
		(ATTACHING PARTS)		
12	MS35649-242	. NUT (96906)	2	PAFZZN
13	MS35333-36	. WASHER (96906)	2	PAFZZN
14	74-3-11-3	. SPACER (04984)	2	MFFZZ-
		---*---		
15	74-4-9-2	. PLATE,REAR (04984)	1	XBFZZ-
		(ATTACHING PARTS)		
16	MS35206-228	. SCREW (96906)	4	PAFZZN
		---*---		
17	A22-2005	. COVER,XSTR JERMYM, SAN FRANCISCO,CA. . .	1	XBFZZ-
18	2N3054	. TRANSISTOR (04713)	1	PADZZN
		(ATTACHING PARTS)		
19	MS20341-6S	. NUT,HEX (96906)	2	PAFZZN
20	MS35338-41	. WASHER (96906)	2	PAFZZN
21	1411-6	. LUG,TERM.#6 (83330)	1	PAFZZN
22	MS35207-228	. SCREW (96906)	2	PAFZZN
		---*---		
23	74-4-1-1	. BOARD,PC ASSY. (A1,A2) (04984) (SEE FIG 8-7 FOR DETAILS)	1	AFFFF-
24	74-3-11-1	. BOARD, BOARD, DIGITAL (04984)	1	MFFZZ-
25	74-3-11-2	. BOARD, BOARD, ANALOG (04984)	1	MFFZZ-
26	SP376	. DECAL, (04984) (IDENT.)	1	XBFZZ-
27	74-3-9-1	. CASE, UPPER, FEM. EXTRUSION (04984) . .	1	XBFBZ-
28	74-3-9-2	. CASE, LOWER, MALE EXTRUSION (04984) . .	1	XBFBZ-
29	59-078-086-0750	. PIN,SPRING (72962)	2	PAFZZN

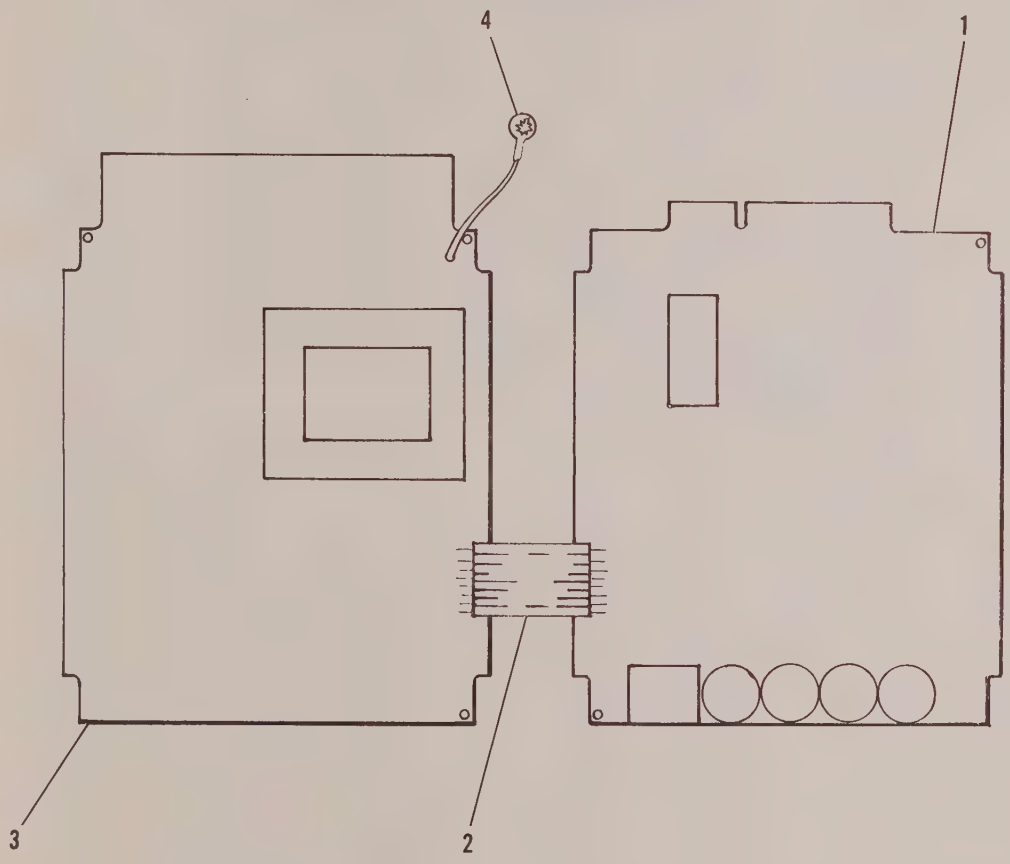

Figure 8-7. PC Board Assembly (A1), (A2)

T.O. 33D4-6-456-3

FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	S M R
8-7 -	74-4-1-1	BOARD,PC ASSY. (A1,A2) (04984) (FOR NHA SEE FIG.8-6)	REF	AFFFF-
1	74-4-1-3	. BOARD ASSY, DIGITAL A1 (04984) (SEE FIG.8-8 FOR DETAILS) (ATTACHING PARTS)	1	PAFFFP
2	74-4-1-4	. RIBBON,CABLE 8 CONDUCTOR (04984) . . .	1	PAFZZN
		---*---		
3	74-4-1-2	. BOARD ASSY, ANALOG A2 (04984) (SEE FIG.8-9FOR DETAILS)	1	PAFZZN
4	74-4-1-5	. JUMPER W/GND LUG (04984)	1	XBFZZ-

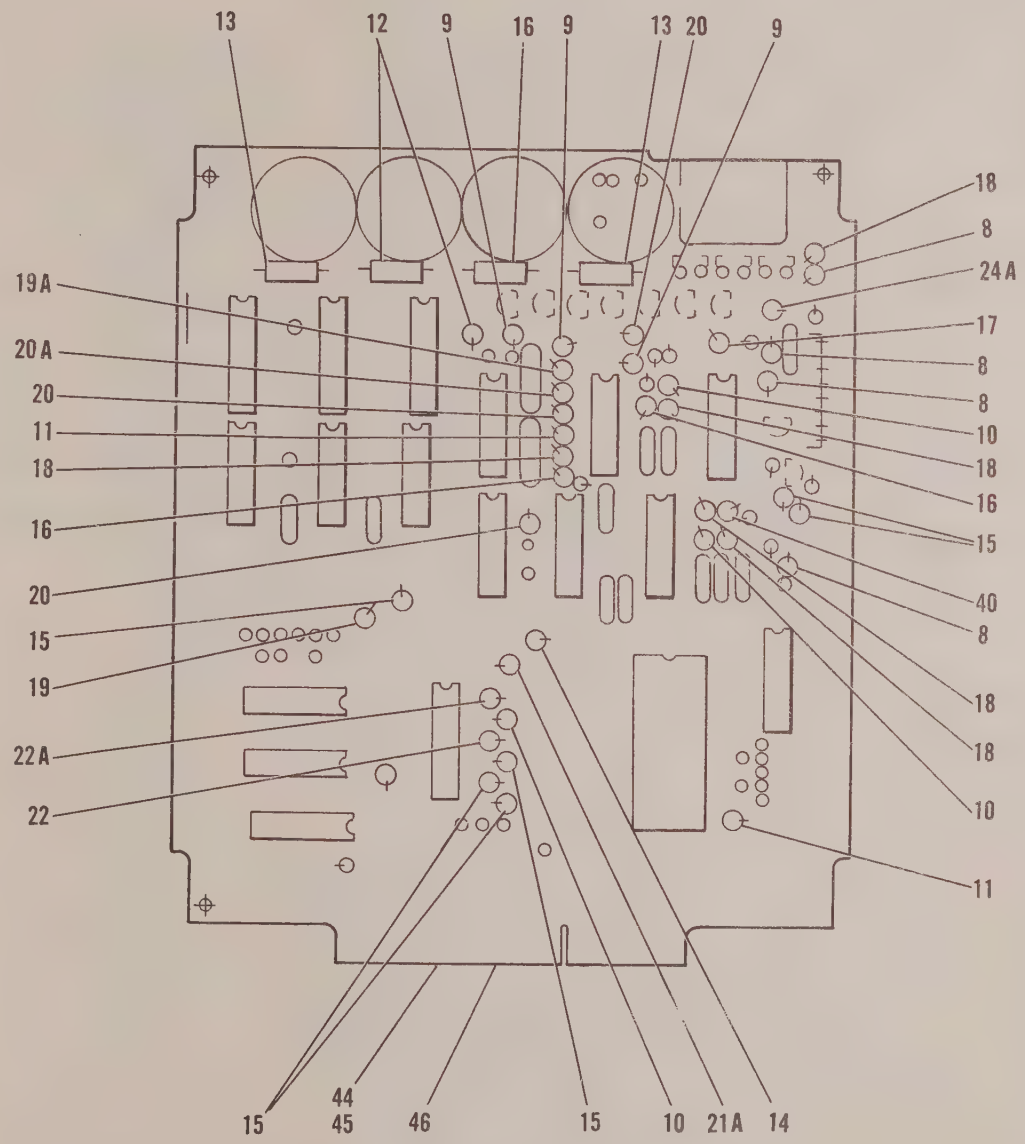

Figure 8-8. Digital (A1) Board Assembly (Sheet 1 of 2)

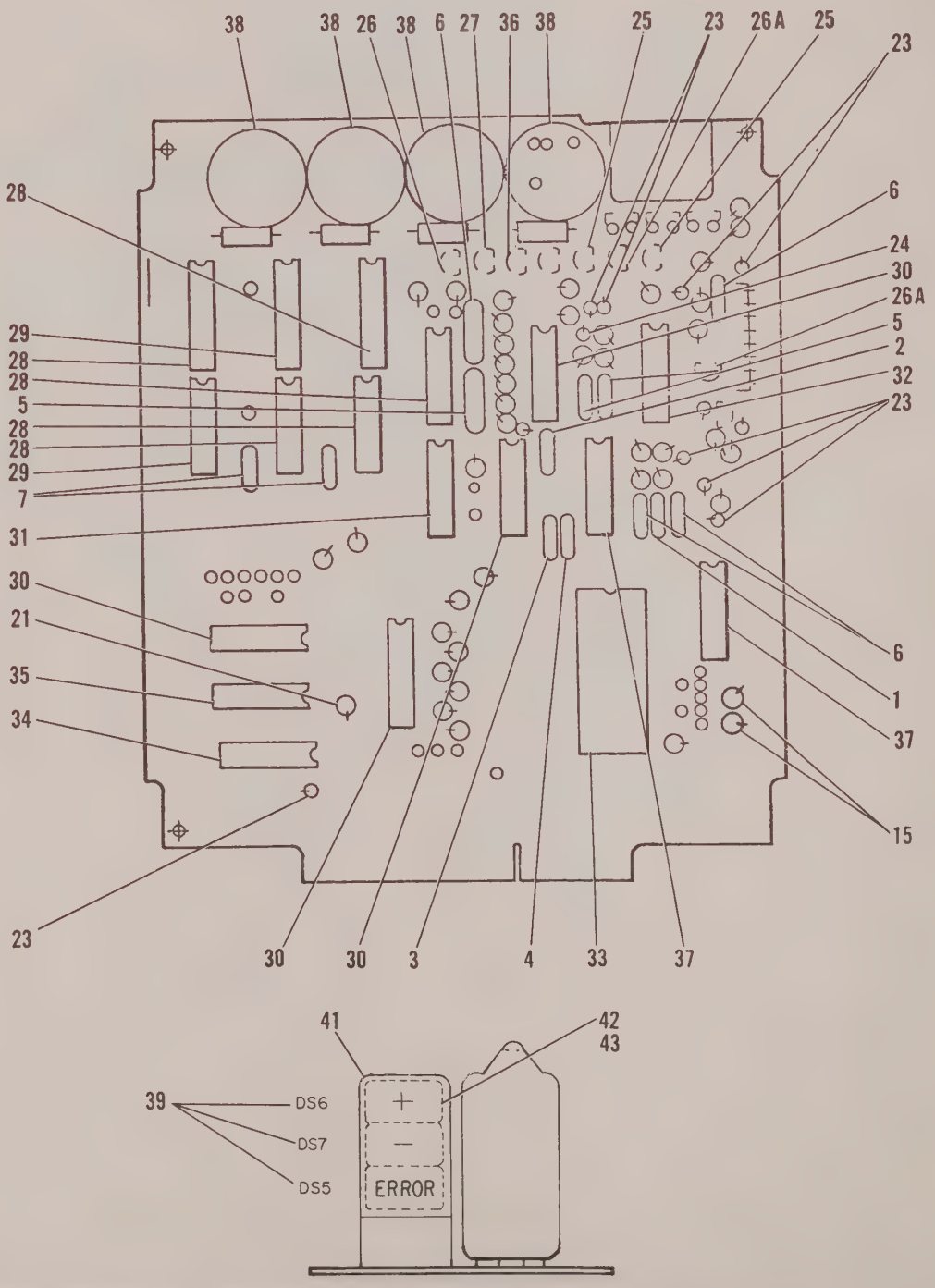

Figure 8-8. Digital (A1) Board Assembly (Sheet 2 of 2)

T.O. 33D4-6-456-3

FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	S M R
8-8 -	74-4-1-3	BOARD ASSY, DIGITAL A1 (04984) (FOR NHA SEE FIG.8-7)	REF	PAFFFP
1	C023B102E330M	. CAPACITOR, 33PF CERAMIC 33 PF 1KV 20% (56289)	1	PADZZN
2	C023B102E221M	. CAPACITOR, CERAMIC 220PF 1KV 10% (56289)	1	PADZZN
3	C023B102E681M	. CAPACITOR, CERAMIC 680PF 1KV 10% (56289)	1	PADZZN
4	C023B102G332M	. CAPACITOR, CERAMIC 3300PF 1KV 20% (56289)	1	PADZZN
5	C280AE-A10M	. CAPACITOR MYLAR .01MFD 250V 20% (34553)	2	PADZZN
6	C00280AEA100M	. CAPACITOR, MYLAR .1 MFD 250V 20% (34553)	5	PADZZN
7	C023B102E152M	. CAPACITOR CERAMIC 1500PF 1KV 20% (56289)	2	PADZZN
8	1-4-5P3K9T	. RESISTOR, CARB FILM 3.9K 1/4W, 5% (34553)	4	PADZZN
9	1-4-5P47CET	. RESISTOR, CARB FILM 470 OHM 1/4W 5% (34553)	2	PADZZN
10	1-4-5P680ET	. RESISTOR, CARB. FILM 680 OHM 1/4W 5% (34553)	4	PADZZN
11	1-4-5P1KT	. RESISTOR,1K CARB. FILM 1K OHM 1/4W 5% (34553)	2	PADZZN
12	1-4-5P1K5T	. RESISTOR, CARB. FILM 1.5K OHM 1/4W 5% (34553)	2	PAFZZN
13	1-4-5P2K2T	. RESISTOR CARB. FILM 2.2K OHM 1/4W 5% (34553)	2	PAFZZN
14	1-4-5P4K7T	. RESISTOR,4.7K CARB. FILM 4.7K OHM 1/4W 5% (34553)	1	PADZZN
15	1-4-5P6K8T	. RESISTOR CARB. FILM 6.8K OHM 1/4 W, 5% (34553)	8	PAFZZN
16	1-4-5P18KT	. RESISTOR,18K, R12,13,14,26,29 18KOHM 1/4W, 5% (34553)	3	PAFZZN
17	1-4-5P22KT	. RESISTOR, CARB FILM 22K OHM 1/4W, 5% (34553)	1	PAFZZN
18	1-4-5P47KT	. RESISTOR,47K, CARB FILM 47K OHM 1/4W, 5% (34553)	5	PAFZZN
19	1-4-5P33KT	. RESISTOR, CARB FILM 33K OHM 1/4W, 5% (34553)	1	PAFZZN
19A	1-4-5P182ET	. RESISTOR, CARB FILM 182 OHM 1/4W, 5% (34553)	1	PAFZZN
20	1-4-5P100KT	. RESISTOR,100K CARB FILM 100K OHM 1/4W, 5% (34553)	3	PADZZN
20A	1-4-5P4K99T	. RESISTOR, CARB FILM 4.99K 1/4W, 5% (34553)	1	PAFZZN
21	1-4-5P6M8T	. RESISTOR, CARB FILM 6.8M OHM 1/4W, 5% (34553)	1	PAFZZN
21A	1-4-5P510ET	. RESISTOR, CARB FILM 510 OHM 1/4W, 5% (34553)	1	PAFZZN
22	1-4-5P150KT	. RESISTOR, CARB FILM 150K OHM 1/4W, 5% (34553)	1	PADZZN
22A	1-4-5P10KT	. RESISTOR, CARB FILM 10K 1/4W, 5% (34553)	1	PAFZZN
23	1N4448	. DIODE, SW (13715)	8	PAFZZN
24	1N4004	. DIODE, RECTIFIE (01295)	1	PAFZZN
24A	1N7469	. ZENER,3.3V (13715)	1	PAFZZN
25	MPS5551M	. TRANSISTOR, NPN (13715)	2	PADZZN
26	2N5961	. TRANSISTOR, NPN (13715)	1	PADZZN
26A	45166	. TRANSISTOR,NPN HIGH VOLTAGE (32873)	2	PAFZZN
27	2N5224	. TRANSISTOR, NPN (13715)	1	PADZZN
27A	2N5771	. TRANSISTOR,PNP FREQUENCY SW (13715)	1	PAFZZN
28	DM8880	. DECODER, DRIVER (27014)	4	PAFZZN
29	SN7490N	. DECADE COUNTER (01295)	3	PADZZN
30	U6A747359X	. FLIP/FLOP (13715)	5	PAFZZN
31	U6A993659X	. INVERTER,HEX (13715)	1	PAFZZN
32	9946	. INPUT NAND, INPUT (07263)	1	PADZZN
33	U6A996259X	. INPUT NAND, INPUT (13715)	1	PADZZN
34	U6A749359X	. BINARY COUNTER, BINARY (13715)	1	PADZZN
35	SN7497N	. RATE MULTIPLIER BINARY (01295)	1	PADZZN
36	2N5771	. TRANSISTOR,PNP HIGH,FREQ. SW. (13715)	1	PAFZZN
37	U6A740059X	. NAND,QUAD-2 (27014)	2	PAFZZN
38	ZM1000	. NIXIE TUBE (34553)	4	PAFZZN
39	3AH	. LAMP, NEON (08806)	3	PAFZZN
40	1537-92	. INDUCTOR, 220 200 MHY (99800)	1	PAFZZN
41	01918	. BLOCK, LEGEND (04984)	1	XBFZZ-
42	02543	. FILM, LEGEND I ERROR (04984)	1	XBFZZN
43	MS24649-10	SCREW, SELF-TAP SELF TAP (96906)	2	PAFZZN
44	298	. JUMPER,WIRE 22 AWG (23172)	AR	XBFZZ-
45	583529-1	. SOCKET,16PIN STRIP (31514)	1	PAFZZN
46	1537-92	. INDUCTOR, 220 (99800)	1	PAFZZN
47	03131-01B	. BOARD, PRINTED WIRING (04984)	1	XAFZZ-

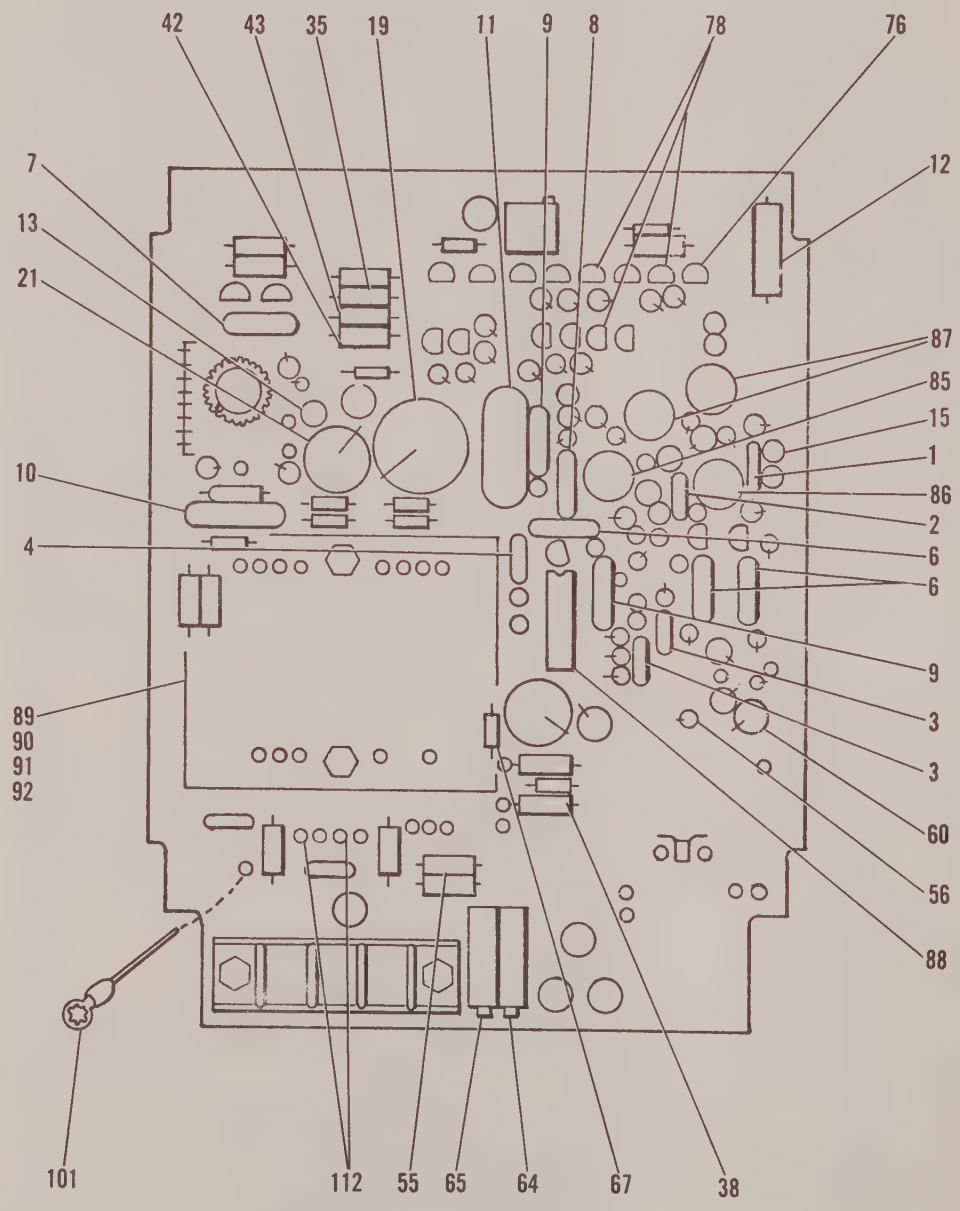

Figure 8-9. Analog (A2) Board Assembly (Sheet 1 of 3)

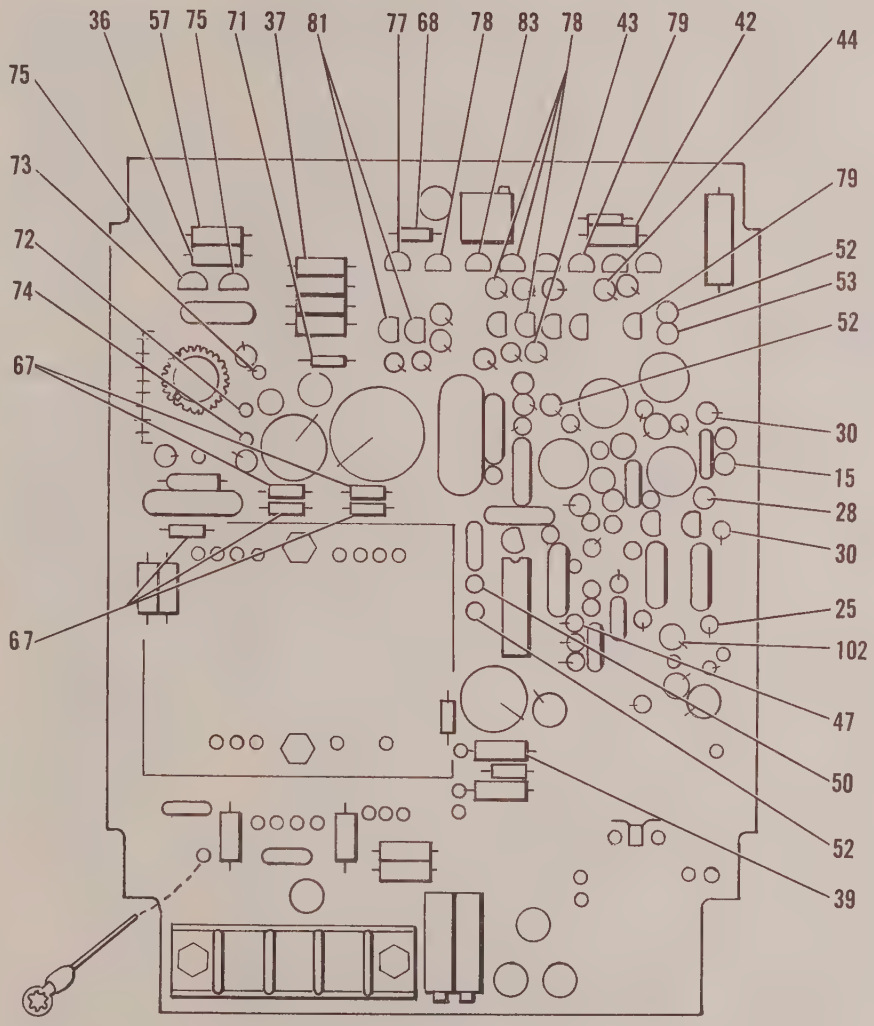

Figure 8-9. Analog (A2) Board Assembly (Sheet 2 of 3)

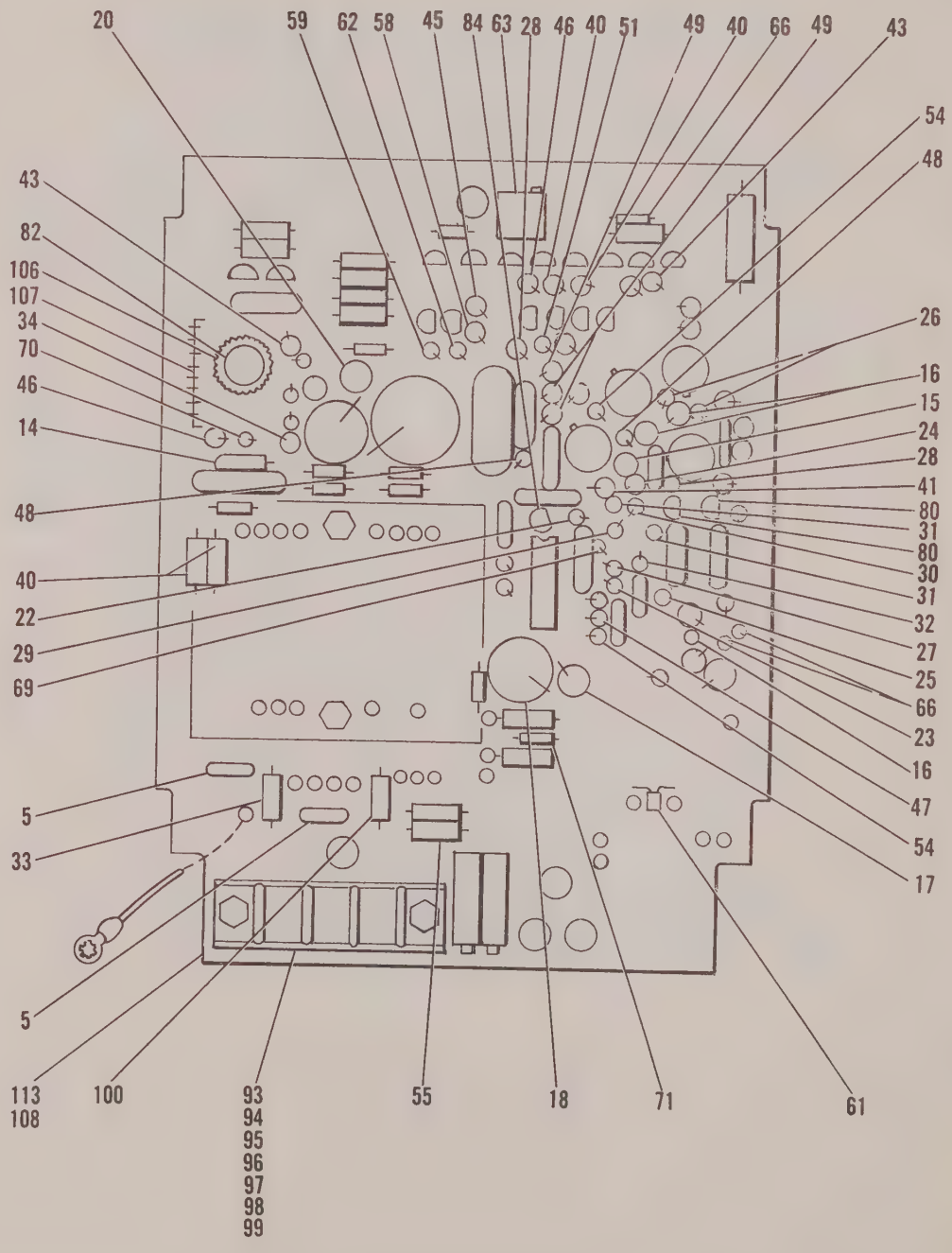

Figure 8-9. Analog (A2) Board Assembly (Sheet 3 of 3)

T.O. 33D4-6-456-3

FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	S M R
8-9 -	74-4-1-2	BOARD ASSY, ANALOG A2 (04984) (FOR NHA SEE FIG. 8-7)	REF	PAFZZN
1	D155C020D0	. CAPACITOR,MICA 2 PF 500V 5% (53021)	1	PAFZZN
2	5GA-Q47	. CAPACITOR, 47PF 1KV 20% CERAMIC (56289)	1	PAFZZN
3	5GA-T33	. CAPACITOR, CERAMIC 330 PF 1KV 20% (56289)	2	PAFZZN
4	5GA-T22	. CAPACITOR, CERAMIC 220PF 1KV 20% (56289)	1	PAFZZN
5	5GA-D33	. CAPACITOR, CERAMIC 3300PF 1KV 20% (56289)	2	PAFZZN
6	75F1R1A222	. CAPACITOR MYLAR .0022UF 100V, 5% (06001)	3	PAFZZN
7	C280AEA2K2	. CAPACITOR,10% MYLAR .022UF 250V 10% (34553)	1	PAFZZN
8	C280AEA3K3	. CAPACITOR MYLAR .033UF 250V 10% (34553)	1	PAFZZN
9	C280AEA68K	. CAPACITOR, 10% MYLAR .068UF 250V 10% (34553)	2	PADZZN
10	C280CFA100K	. CAPACITOR, MYLAR .1UF 400V 10% (34553)	1	PAFZZN
11	C280AEA390K	. CAPACITOR, 10% MYLAR .35UF 250V 10% (34553)	1	PADZZN
12	625B1A105	. CAPACITOR, 10% PALY CARB 1.0UF 50V 10% (14752)	2	PAFZZN
13	25VTAG	. CAPACITOR, 25V TANTALUM 1.0UF 25V +50% -20% (15238)	1	PADZZN
14	K1C35	. CAPACITOR, 20% TANTALUM 1.0UF 35V 20% (05397)	1	PADZZN
15	TAG16V3	. CAPACITOR,4.7UF TANTALUM 4.7UF 16V +50% -20% (15238)	3	PADZZN
16	TAG16V5	. CAPACITOR,10UF TANTALUM 10UF 16V +50% -20% (15238)	3	PADZZN
17	ET10CX063A3	. CAPACITOR,10UF ELECT. 10UF 64V, 50% (44028)	1	PAFZZN
18	T360C686M015AS	. CAPACITOR, ELECT. 68UF 15V, 20% (34553)	1	PAFZZN
19	C437-AR-E1500	. CAPACITOR ELECT. 1500UF 16V +50% -10% (34553)	1	PAFZZN
20	T360C686M015AS	. CAPACITOR TANTALUM 68UF 15V, 20% (05397)	1	PAFZZN
21	ET151X063A01	. CAPACITOR, ELECT. 150UF 63V, 50% (80031)	1	PADZZN
22	1-4-5P56ET	. RESISTOR, 560HM 1/4W, 5% (34553)	2	PADZZN
23	1-4-5P1KT	. RESISTOR,1K 1K OHM 1/4W 5% (34553)	1	PADZZN
24	1-4-5P3K3T	. RESISTOR, 3.3K OHM 1/4W 5% (34553)	1	PADZZN
25	1-4-5P4K7T	. RESISTOR,4.7K 4.7K OHM 1/4W 5% (34553)	2	PADZZN
26	1-4-5P39KT	. RESISTOR, 39K 39K OHM 1/4W 5% (34553)	2	PADZZN
27	1-4-5P56KT	. RESISTOR, 56K OHM 1/4W 5% (34553)	1	PADZZN
28	1-4-5P100KT	. RESISTOR,100K 100K OHM 1/4W 5% (34553)	2	PADZZN
29	1-4-5P180KT	. RESISTOR, 180K 180K OHM 1/4W 5% (34553)	1	PADZZN
30	1-4-5P1MT	. RESISTOR,1M 1 MEG 1/4W 5% (34553)	3	PADZZN
31	1-4-5P2M2	. RESISTOR, 2.2 MEG 1/4W 5% (34553)	1	PADZZN
32	1-4-10P56M	. RESISTOR,CC 56 MEG 1/4W 10% (34553)	1	PADZZN
33	1550	. RESISTOR JUMPER, LOOPED (23172)	AR	PADZZN
34	1-2-5P82ET	. RESISTOR,CC 18 OHM 1/4W 5% (34553)	1	PAFZZ-
35	1-2-10P560ET	. RESISTOR, CARB FILM 560 OHM 1/2W 1.0% (34553)	1	PADZZN
36	1-2-10P820ET	. RESISTOR, CARB FILM 820 OHM 1/2W 10% (34553)	1	PADZZN
37	1-2-10P1K5T	. RESISTOR, FIXED CARB FILM 1.5K OHM 1/2W 10% (34553)	1	PADZZN
38	1-2-10P1K8T	. RESISTOR,1.8K CARB FILM 1.8K OHM 1/2W 10% (34553)	1	PADZZN
39	1-2-10P2K2T	. RESISTOR, FIXED CARB FILM 2.2K OHM 1/2W 10% (34553)	1	PADZZN
40	1-2-10P3K9T	. RESISTOR,3.9K CARB FILM 3.9K OHM 1/2W 10% (34553)	2	PADZZN
41	1-2-10P4K7T	. RESISTOR, CARB FILM 4.7K OHM 1/2W 10% (34553)	3	PADZZN
42	1-2-10P6K8T	. RESISTOR, FIXED CARB FILM 6.8K OHM 1/2W 10% (34553)	2	PADZZN
43	1-2-10P6K12KT	. RESISTOR, CARB FILM 12K OHM 1/2W 10% (34553)	4	PADZZN
44	1-2-10P15KT	. RESISTOR, 15K CARB FILM 15K OHM 1/2W 10% (34553)	1	PADZZN
45	1-2-10P27KT	. RESISTOR, 27K CARB FILM 27K OHM 1/2W 10% (34553)	1	PADZZN
46	1-2-10P39KT	. RESISTOR,39K CARB FILM 39K OHM 1/2W 10% (34553)	2	PADZZN
47	1-2-10P56KT	. RESISTOR,56K CARB FILM 56K OHM 1/2W 10% (34553)	2	PADZZN
48	1-2-10P100KT	. RESISTOR, FIXED CARB FILM 56K OHM 1/2W 10% (34553)	2	PADZZN
49	1-2-10P110KT	. RESISTOR,110K CARB FILM 110K OHM 1/2W 10% (34553)	3	PADZZN
50	1-2-10P150KT	. RESISTOR, FIXED CARB FILM 150K OHM 1/2W 10% (34553)	1	PADZZN
51	1-2-10P220KT	. RESISTOR,220K CARB FILM 220K OHM 1/2W 10% (34553)	2	PADZZN

T.O. 33D4-6-456-3

FIGURE AND INDEX NUMBER	PART NUMBER	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	S M R
8-9 - 52	1-2-10P330KT	. RESISTOR,330K CARB FILM 33K OHM 1/2W 10% (34553) .	2	PADZZN
53	1-2-10P1MT	. RESISTOR,1M CARB FILM 1MEG (34553) . .	1	PADZZN
54	1-2-10P4M7	. RESISTOR, 4.7M OHM 1/2W 10% (34553) . .	2	PADZZN
55	RNR55C1CR0F	. RESISTOR,MF 10 OHMS 1/8W 1% (81349) . .	2	PAFZZN
56	RN6CC1000F	. RESISTOR,MF 100 OHMS 1/8W 1% (81349) . .	1	PAFZZN
57	RNR55C5620F	. RESISTOR,MF 562 OHMS 1/8W 1% (81349) . .	1	PAFZZN
58	RNR55C1871F	. RESISTOR,MF 1.87K OHMS 1/8W 1% (81349) .	1	PAFZZN
59	MF5CE1212F	. RESISTOR,12.1K 12.10K OHM 1/8W 1% 25PPM (19701) .	1	PADZZN
60	TR5	. RESISTOR,10K 10K OHMS 5W 3% (01686) . .	1	PADZZN
61	JB31J2	. THERMISTER (15801)	1	PADZZN
62	74-4-1-2R65	. RESISTOR VALUE 500K, SELECT IN TEST (04984)	1	PADZZN
63	66PR50	. RESISTOR, VARIABLE 50 OHMS (73138) . .	1	PADZZN
64	89PR20	. RESISTOR, VARIABLE 20 OHMS (73138) . .	1	PAFZZN
65	89PR1K	. RESISTOR,1K, VARIABLE 1K OHMS (73138) . .	1	PAFZZN
66	1N4448	. DIODE, SW (13715)	3	PAFZZN
67	1N4004	. DIODE,SW RECTIFIER (13715)	6	PAFZZN
68	1N4448	. DIODE, SW (13715)	2	PAFZZN
69	HP5082-2833	. DIODE, CARRIER (28480)	1	PAFZZN
70	1N4448	. DIODE, SW (13715)	2	PAFZZN
71	1N825	. DIODE,ZENER (04713)	2	PAFZZN
72	1N759A	. DIODE,ZENER (13715)	1	PAFZZN
73	1N961B	. DIODE,ZENER (13715)	1	PAFZZN
74	1N962B	. DIODE,ZENER (13715)	1	PAFZZN
75	2N5961	. TRANSISTOR, NPN (13715)	2	PADZZN
76	2N5224	. TRANSISTOR, NPN (13715)	1	PADZZN
77	2N3904	. TRANSISTOR (13715)	1	PADZZN
78	2N5961	. TRANSISTOR (07263)	7	PADZZN
79	2N5086	. TRANSISTOR (07263)	2	PADZZN
80	SCD1C650	. TRANSISTOR, (04984) (MATCHED PAIR) . .	1	PADZZN
81	2N5086	. TRANSISTOR, (13715)	2	PADZZN
82	2N4030	. TRANSISTOR, (13715)	1	PADZZN
83	2N5457	. TRANSISTOR, (04713)	1	PADZZN
84	KE4416	. TRANSISTOR,FET (27014)	1	PADZZN
85	U5B774139X	. AMPLIFIER, (13715)	1	PADZZN
86	U5B770939X	. AMPLIFIER, (13715)	1	PADZZN
87	SG3250	. OP/AMP (34333)	2	PAFZZN
88	CD40C7AE	. INVERTER, (49671)	1	PADZZN
89	48036	. TRANSFORMER, (04984) . . . . . (ATTACHING PARTS)	1	PADZZN
90	MS35206-325	. SCREW 4-40 X 1 3/8 LG. (96906) . . .	2	PAFZZN
91	9103030	. SPACER, 1/4OD 7/16 LG. (04984) . . .	2	PAFZZN
92	MS35335-29	. WASHER, LOCK INT. TOOTH, #4 (96906) . .	2	PAFZZN
93	MS35649-242	. NUT #4 (96906)	2	PAFZZN
		---*---		
94	599-2021-3	. TERMINAL BLOCK TERMINAL (75382) . . . (ATTACHING PARTS)	1	XBFZZ-
95	MS35206-219	. SCREW, 4-40 X 3/4 LG. (96906)	2	PAFZZN
96	9103088	. SPACER, 3/16 LG. (04984)	2	XBFZZN
97	MS35338-40	. WASHER #4 (96906)	2	PAFZZN
98	MS20341-45	. NUT,HEX, #4 (96906)	2	PAFZZN
		---*---		
99	0315C	. COVER, TB1 (04984)	1	XBFZZ-
100	275 250	. FUSE 1/4 AMP (75915)	1	PAFZZN
101	01641-02	. JUMPER, WITH GND. LUG (04984)	1	MFZZ--
102	04237	. TRANSISTOR AY. ASSY. (32873)	1	PAFZZN
103	MS51859-3	. WASHER, (96906)	2	PAFZZN
104	MS51859-6	. WASHER, (96906)	1	PAFZZN
105	04236	. PLATE,SHIELD (04984)	1	XBFZZ-
106	3AL635-2R	. HEAT SINK, TO-5 (07387)	1	PADZZN
107	74-3-10-4	. CABLE, FLAT, 8 COND. (04984)	1	XBFZZ-
108	298	. JUMPER WIRE, 22 AWG. BUSS (92194) . . .	AR	PAFZZN
109	FIT105-1-16	. TUBING,SHRINK 2 1/2 LG BLACK (92194) . .	1	XBFZZ-
110	1551	. WIRE,JUMPER, 22 AWG. (92194)	AR	XBFZZ-
111	KF2-4-40	. NUT, SPLINE FASTENER (46384)	9	PAFZZN
112	298	. JUMPER WIRE, E3 TO E4 22 AWG BUSS (92194) .	2	PAFZZN
113	04253-01A	. BOARD, PRINTED WIRING (04984)	1	XBFZZ-

SECTION IX
NUMERICAL INDEX

PART NUMBER	FIG. AND INDEX NO.	QTY. PER ART.
AN960-4	8-4-75	6
	8-5-92	
A22-2005	8-6-17	1
CD4007A	8-5-89	1
CD4007AE	8-9-88	1
CM05-020	8-5-1	1
C00280AEA100M	8-8-6	5
C023B102E100M	8-4-1	1
C023B102E152M	8-3-7	3
	8-8-7	
C023B102E221M	8-3-2	2
	8-8-2	
C023B102E330M	8-3-1	3
	8-4-2	
	8-8-1	
C023B102E471M	8-3-8	1
C023B102E681M	8-3-3	1
	8-8-3	
C023B102G332M	8-3-4	4
	8-4-14	
	8-8-4	
C280AE/A2K2	8-5-7	1
C280AE/A3K3	8-5-8	1
C280AE/A390K	8-5-11	1
C280AE/A68K	8-5-9	2
C280AE-A10M	8-8-5	2
C280AEA10K	8-3-5	2
C280AEA100K	8-3-6	5
C280AEA2K2	8-9-7	1
C280AEA22K	8-4-4	1
C280AEA3K3	8-9-8	1
C280AEA390K	8-4-7	2
	8-9-11	
C280AEA68K	8-4-5	3
	8-9-9	
C280CF/P100K	8-5-10	1
C280CFA100K	8-4-6	3
	8-9-10	
C426ARH10	8-4-11	1
C437-AR-E-1500	8-5-19	2
	8-9-19	
C437-AR-G-100	8-5-18	2
C437ARE1500	8-4-13	1
C437ARH100	8-4-12	2
DMSN7470	8-3-29	3
DM8880	8-8-28	4
D155C020D0	8-9-1	1
ET10CX063A3	8-9-17	1
ET100X06343	8-5-17	1
ET151X063A01	8-9-21	1
FIT105-1-16	8-9-109	1
HKP	8-1-10	1
HP5082-2833	8-5-71	2
	8-9-69	
IC776	8-5-88	2
JB31J2	8-4-46	3
	8-5-61	
	8-9-61	
J5B7725393	8-4-70	1
KE4416	8-9-84	1
KF2-4-40	8-9-111	9
K1C35	8-4-10	3
	8-5-14	
	8-9-14	

PART NUMBER	FIG. AND INDEX NO.	QTY. PER ART.
LM301A	8-4-71	1
LPTTULSS1-9L00	8-3-36	1
MDL1-4	8-1-11	1
MF5C-1212-F	8-5-59	1
MF5C05620F	8-5-56	1
MFCD1212F	8-4-44	1
MF5CD1309F	8-4-51	1
MF5CD1871F	8-4-40	2
	8-5-57	
MF5CD2000F	8-4-38	3
MF5CD2492F	8-4-54	2
MF5CD4990F	8-5-54	2
MF5CD4991F	8-4-41	2
	8-5-58	
MF5CD5620F	8-4-39	1
MF5CD6041F	8-4-42	1
MF5CD6988F	8-4-53	1
MF5CD8061F	8-4-55	1
MF5CD8259F	8-4-52	1
MF5CD9091F	8-4-43	1
MF5C1009E	8-5-55	1
MF5CE1009F	8-4-37	1
MF5CE1212F	8-9-59	1
MM55221	8-3-7	1
MPS55551M	8-3-25	9
	8-8-25	
MS20341-4S	F8-4-73	8
	F8-4-76	
	F8-5-93	
MS20341-45	8-9-98	2
MS20341-6S	8-6-19	0
MS246-10	F8-3-40	4
	8-8-43	
MS2520-4	8-1-19	1
MS3102-E10SL4P	8-1-3	1
MS3102E14S7P	8-1-4	
MS35058-22	8-1-13	2
MS35206-215	F8-1-3	8
	F8-1-4	
MS35206	F8-4-77	6
	F8-5-94	
	8-9-95	
MS35206-228	F8-1-16	22
	F8-1-17	
	F8-2-7	
	8-6-9	
MS35206-325	F8-4-73	6
	F8-5-90	
	8-9-90	
MS35207-228	8-6-22	2
MS35333-36	F8-2-14	4
	8-6-13	2
MS35335-29	F8-4-73	10
	F8-5-90	
	8-9-92	
MS35338-40	F8-1-3	10
	F8-1-4	
	8-9-97	
MS35338-41	F8-1-17	12
	8-2-16	4
	8-6-20	2
MS35338-42	8-6-3	2
MS35649-242	F8-1-3	14
	F8-1-4	

PART NUMBER	FIG. AND INDEX NO.	QTY. PER ART.
MS35649-242	F8-2-14	
	8-6-12	
	8-9-93	
MS35649-262	F8-1-17	10
	8-2-17	
MS51859-3	8-4-81	6
	8-5-98	
MS51859-6	8-4-82	3
	8-5-99	
	8-9-104	
MS51861-1C	8-6-5	4
MS51861-22	F8-1-1	20
	F8-1-2	
	F8-1-5	
	F8-1-6	
RESISTOR	8-5-62	1
RNR55C10ROF	8-9-55	2
RNR55C1871F	8-9-58	1
RNR-55C5620F	8-9-57	1
RN60C1000F	8-9-56	1
SCD10639	8-2-14	2
	8-6-11	1
SCD10650	8-5-81	2
	8-9-80	
SG3250	8-9-87	2
SN7490N	8-8-29	3
SN7497N	8-3-35	2
	8-8-35	
SP325-4	8-1-7	1
SP376	8-6-26	1
TAG16V3	8-5-15	12
	8-5-16	
	8-9-15	
	8-9-16	
TR5	8-4-45	3
	8-5-60	
T306C686M015AS	8-9-18	2
	8-9-20	
T36-D686-015AS	8-5-20	1
U1994E	8-5-85	1
U5B770939X	8-5-87	2
	8-9-86	
U5B774139X	8-4-72	3
	8-5-86	
	8-9-85	
U6A740059X	8-8-37	2
U6A744159X	8-3-28	1
U6A747359X	8-3-30	9
	8-7-30	
U6A749359X	8-3-34	2
	8-8-34	
U6A993659X	8-3-31	2
	8-8-31	
U6A996259X	8-3-33	2
	8-8-33	
W440-3	8-6-2	2
ZM1000	8-3-38	8
	8-8-38	
01641-02	8-5-96	2
	8-9-101	1
01918	8-3-40	4
	8-8-41	
02543	8-3-41	2
	8-8-42	
03131-01B	8-3-43	2
	8-8-47	

PART NUMBER	FIG. AND INDEX NO.	QTY. PER ART.
03136-01B	8-4-83	1
03150	8-4-76	3
	8-5-93	
	8-9-100	
04236	8-5-100	2
	8-9-105	
04237	8-5-97	2
	8-9-102	
04253-01A	8-5-106	2
	8-9-113	
IN4004	8-3-24	18
	8-4-58	
	8-5-69	
	8-8-24	
	8-9-67	
IN4448	8-3-23	38
	8-5-68	
	8-4-57	
	8-5-70	
	8-8-23	
	8-9-66	
	8-9-68	
	8-9-70	
IN7469	8-8-24A	1
IN748A	8-4-62	2
	8-5-72	
IN759A	8-4-60	6
	8-5-74	
	8-9-72	
IN825	8-4-61	6
	8-5-73	
IN961B	8-5-75	2
	8-9-73	
IN962B	8-9-74	1
1-2-P1K5T	8-4-21	1
1-2-10P1KT	8-3-11	2
1-2-10P1K5T	8-3-12	3
	8-5-36	
	8-9-37	
1-2-10P1K8T	8-5-37	2
	8-9-38	
1-2-10P1MT	8-4-36	4
	8-5-52	
	8-9-53	
1-2-10P10ET	8-4-17	3
	8-5-32	
1-2-10P100KT	8-3-20	7
	8-5-47	
	8-9-48	
1-2-10P110KT	8-4-33	9
	8-5-48	
	8-9-49	
1-2-10P12KT	8-4-27	4
	8-5-42	
1-2-10P120ET	8-4-20	1
1-2-10P15KT	8-4-28	3
	8-5-43	1
	8-9-44	1
1-2-10P150KT	8-3-22	3
1-2-10P18KT	8-3-16	11
1-2-10P2K2T	8-3-13	7
	8-4-22	
	8-5-38	
	8-9-39	
1-2-10P22KT	8-3-17	1
1-2-10P27KT	8-4-30	4

PART NUMBER	FIG. AND INDEX NO.	QTY. PER ART.
1-2-10P27KT	8-5-44	
	8-9-45	
1-2-10P220KT	8-4-34	8
	8-5-50	3
	8-9-51	2
1-2-10P3K9T	8-4-24	6
	8-5-39	
	8-9-40	
1-2-10P30ET	8-4-16	1
1-2-10P33KT	8-4-31	1
1-2-10P330KT	8-4-33	5
	8-5-51	
	8-9-52	
1-2-10P39KT	8-4-32	6
	8-5-45	
	8-9-46	
1-2-10P4K7T	8-3-14	14
	8-4-25	
	8-5-40	
	8-9-41	
1-2-10P4M7	8-5-53	5
	8-9-54	
1-2-10P47ET	8-4-18	1
1-2-10P47KT	8-3-18	3
1-2-10P470ET	8-3-9	2
1-2-10P56KT	8-5-46	4
	8-9-47	
1-2-10P560ET	8-534	2
	8-9-35	
1-2-10P6K12KT	8-9-43	4
1-2-10P6K8T	8-3-15	13
	8-4-26	
	8-5-41	
	8-9-42	
1-2-10P6M8T	8-3-21	1
1-2-10P68KT	8-3-19	2
1-2-10P680-ET	8-3-10	3
1-2-10P82ET	8-5-33	2
	8-9-34	1
1-2-10P820-ET	8-4-19	3
	8-5-35	
	8-9-36	
1-2-10P82ET	8-5-33	2
	8-9-34	
1-2-10P680-ET	8-3-10	3
1-4-5P1KT	8-5-22	4
	8-8-11	
	8-9-23	
1-4-5P1K5T	8-8-12	2
1-3-10P1K8T	8-4-23	1
1-4-5P1MT	8-5-29	6
	8-9-30	
1-4-5P10KT	8-8-22A	1
1-4-5P100KT	8-5-27	2
1-4-5P100KT	8-8-20	3
1-4-5P100KT	8-9-28	2
1-4-5P150KT	8-8-22	1
1-4-5P18CKT	8-9-29	4
	8-8-16	
1-4-5P180KT	8-5-28	1
1-4-5P182ET	8-8-19A	1
1-4-5P2K2T	8-8-13	2
1-4-5P2M2	8-5-30	2
	8-9-31	1
1-4-5P22KT	8-8-17	1
1-4-5P3K3T	8-5-23	2
	8-9-24	1

PART NUMBER	FIG. AND INDEX NO.	QTY. PER ART.
1-4-5P3K9T	8-8-8	4
1-4-5P33KT	8-8-19	1
1-4-5P39KT	8-5-25	4
	8-9-26	
1-4-5P4K7T	8-5-24	5
	8-8-14	
	8-9-25	
1-4-5P4K99T	8-8-20A	1
1-4-5P47CET	8-8-9	2
1-4-5P47KT	8-8-18	5
1-4-5P510ET	8-8-21A	1
1-4-5P56ET	8-5-21	4
	8-9-22	
1-4-5P56KT	8-5-26	3
	8-9-27	
1-4-5P56M	8-5-31	2
	8-9-32	
1-4-5P6K8T	8-8-15	8
1-4-5P6M8T	8-8-21	1
1-4-5P680ET	8-8-10	4
1411-6	8-6-21	1
1537-92	8-3-42	3
	8-8-40	
	8-8-46	
1550	8-9-33	AR
1551	8-9-110	AR
2N3054	8-6-18	1
2N3904	8-5-78	2
	8-9-77	
2N4030	8-4-66	3
	8-5-83	
	8-9-82	
2N5086	8-4-67	12
	8-4-68	
	8-5-80	
	8-5-82	
	8-9-79	
	8-9-81	
2N5224	8-3-27	5
	8-4-64	
	8-5-77	
	8-8-27	
	8-9-76	
2N5457	8-4-69	3
	8-5-84	
	8-9-83	
2N5771	8-8-27A	2
	8-8-36	
2N5961	8-3-26	34
	8-4-63	
	8-4-65	
	8-5-76	
	8-5-79	
	8-8-26	
	8-9-75	
	8-9-78	
210B1B473K	8-4-3	1
210B1C233K	8-4-15	1
25VTAG	8-4-9	7
	8-5-13	
	8-9-13	
275-250	8-4-78	3
	8-5-95	
	8-9-100	
298	8-5-103	AR
	8-8-44	
	8-9-108	

PART NUMBER	FIG. AND INDEX NO.	QTY. PER ART.
298	8-9-112	
3AH	8-3-39	6
	8-8-39	
3AL635-2R	8-9-106	1
3AL6635-2R	8-5-101	
33-276	8-1-12	1
45166	8-8-26A	2
47008	8-4-59	2
48036	8-4-73	3
	8-5-90	
	8-9-89	
5GA-D33	8-5-5	4
	8-9-5	
5GA-Q22	8-5-2	1
5GA-Q47	8-9-2	1
5GA-T22	8-5-4	2
	8-9-4	
5GA-T33	8-5-3	3
	8-9-3	
501	8-2-15	2
58-26-316-56	8-1-14	2
58-42-3-24	8-2-15	2
583529-1	8-8-45	1
59-078-086-0750	8-6-29	2
599-2021-3	8-4-77	3
	8-4-94	
	8-9-94	
6024-04	8-2-13	1
625B1A105	8-15-12	4
	8-9-12	
625B1A105K	8-4-8	2
66PR50	8-5-63	2
	8-9-63	
72XWR100	8-5-64	1
72XW10K	8-4-29	1
72XW2K	8-4-50	1
74-3-0-1	8-1	1
74-3-0-2	8-1-18	1
74-3-10-2	8-2-9	2
	F8-2-9	
	8-4	REF
	8-5	REF
74-3-10-3	8-2-8	1
	8-3	REF
74-3-10-4	8-2-10	3
	8-5-102	
	8-9-107	
74-3-11-1	8-2-11	2
	8-6-24	
74-3-11-2	8-2-12	2
	8-6-25	
74-3-11-3	F8-2-14	4
	8-6-14	
74-3-2-1	8-1-17	1
74-3-3-1	8-1-8	1

PART NUMBER	FIG. AND INDEX NO.	QTY. PER ART.
74-3-3-2	8-1-9	1
74-3-3-3	8-1-2	1
73-3-3-4	8-1-6	1
74-3-3-5	8-1-5	1
74-3-3-6	8-1-1	1
74-3-7-1	8-2	REF
	8-2-16	1
74-3-7-2	8-1-1	1
74-3-7-3	8-2-4	2
74-3-8-1	F8-2-4	1
74-3-9-1	8-2-5	2
	8-6-27	
74-3-92	8-2-6	2
	8-6-28	
74-3-9-3	8-2-7	1
74-4-1-1	8-6-23	1
	8-7	REF
74-4-1-2	8-7-3	1
	8-9	REF
74-4-1-2R65	8-9-62	1
74-4-1-3	8-7-1	1
	8-8	REF
74-4-1-4	8-7-2	1
74-4-1-5	8-7	1
74-4-9-1	8-6-8	1
74-4-9-2	8-6-15	1
74-4-93	8-6-4	2
74-4-9-4	8-6-10	1
74-4-9-6	8-6-1	2
74-4-9-7	8-6-6	1
74-4-9-8	8-6-7	1
75F1R1C222	8-5-6	1
75F1R1A222	8-9-6	3
78SR1K	8-2-3	2
78SR10	8-2-2	2
	8-4-48	
89PR1K	8-5-66	2
	8-9-65	
89PR2K	8-4-47	2
	8-5-67	1
89PR20	8-9-64	1
89PR200	8-5-65	1
89PR50K	8-4-56	1
9101716	8-4-80	2
	8-5-105	3
9101717	8-4-79	2
	8-5-104	
9103006	8-4-74	4
	8-5-91	
9103030	8-9-91	2
9103088	F8-4-77	6
	F8-4-77	
	F8-5-94	
	8-9-96	
9946	8-3-32	3
	8-8-32	1

TECHNICAL MANUAL

OVERHAUL WITH PARTS BREAKDOWN

INDICATOR, TEMPERATURE, THERMOCOUPLE
MODEL 7430
(PART NUMBER 74-3-0-1)

SPACE CORP.
Contract No. F41608 – 72 – C – 5278

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Page Number	# Change Number
TITLE	1
A	1
i/ii blank	1
iii	0
iv blank	0
1-1 - 1-4	0
2-1/3-1 - 3-4	0
4-1/5-1 - 5-3	0
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6-1	1
6-2 blank	1
7-1 - 7-5	0
7-6 blank	0
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7-8 blank	0
7-9	0
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7-11	0
7-12 blank	0
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7-14 blank	1
8-1 - 8-9	0
8-10	1
8-11 - 8-15	0
8-16	1
8-17	0
8-18 blank	0
8-19 - 8-24	1

Zero in this column indicates an original page.

TABLE OF CONTENTS

Section		Page
LIST OF ILLUSTRATIONS		i/(ii blank)
INTRODUCTION		iii/(iv blank)
I.	GENERAL INFORMATION	1-1
	1-1 General	1-1
	1-3 Theory of Operation	1-1
II.	SPECIAL TOOLS AND TEST EQUIPMENT	2-1/3-1
III.	DISASSEMBLY	2-1/3-1
	3-1 Disassembly	2-1/3-1
IV.	CLEANING	4-1
	4-1 Cleaning	4-1
V.	INSPECTION, REPAIR AND REPLACEMENT	5-1
	5-1 Inspection	5-1
VI.	ASSEMBLY	6-1
	6-1 Assembly	6-1
VII.	TESTING	7-1
	7-1 Testing	7-1
	7-3 Calibration	7-1
VIII.	ILLUSTRATED PARTS BREAKDOWN	8-1

LIST OF ILLUSTRATIONS

No.	Title	Page
1-1	Instruments Face Description	1-2
1-3	Block Diagram, Model 7430	1-4
3-1	Top View, EGT Individual	3-2
3-2	Digital Indicator, Rear View	3-3
3-3	Digital Indicator Installed, Side View	3-4
3-4	Digital Indicator Circuit Boards	3-4
7-1	Test Points Digital A1 Circuit Board	7-2
7-2	Test Points Analog A2 Circuit Board	7-4
7-3	Wiring Diagram	7-7/(7-8 blank)
7-4	Digital A1 Circuit Board Schematic	7-9/(7-10 blank)
7-5	Analog Schematic Diagram	7-11/(7-12 blank)
7-6	Schematic Diagram, Analog	7-13/(7-14 blank)
8-1	Exhaust Gas Temperature Indicator (Sheet 1 of 2)	8-6
8-1	Exhaust Gas Temperature Indicator (Sheet 2 of 2)	8-7
8-2	Thermocouple Type K Indicator	8-9
8-3	Digital PC Board Assembly	8-11
8-4	Analog PC Board Assembly	8-14
8-5	Analog PC Board Assembly	8-19

LIST OF TABLES

No.	Title	Page
1-2	Leading Particulars	1-3
5-1	Inspection Details	4-1/5-1
5-2	Troubleshooting Chart	5-2

INTRODUCTION

INTRODUCTION.

This manual provides overhaul instructions with illustrated parts breakdown for the EGT (exhaust gas temperature) indicator Model 7430, manufactured by Space Corp., Dallas, Texas.

PURPOSE.

The EGT indicator is a high speed, self contained digital temperature indicator for measuring temperature in degrees Fahrenheit from a Type K, chromel alumel thermocouple input. The indicator is compatible with the AFM 37T1; T1A; A/M 37T-6; T-6A; T-6B, T-6C and T-16 engine test stands for measurement of EGT (individual) temperatures. The indicator, however, may be used for any temperature measurement utilizing the referenced thermocouple.

SCOPE.

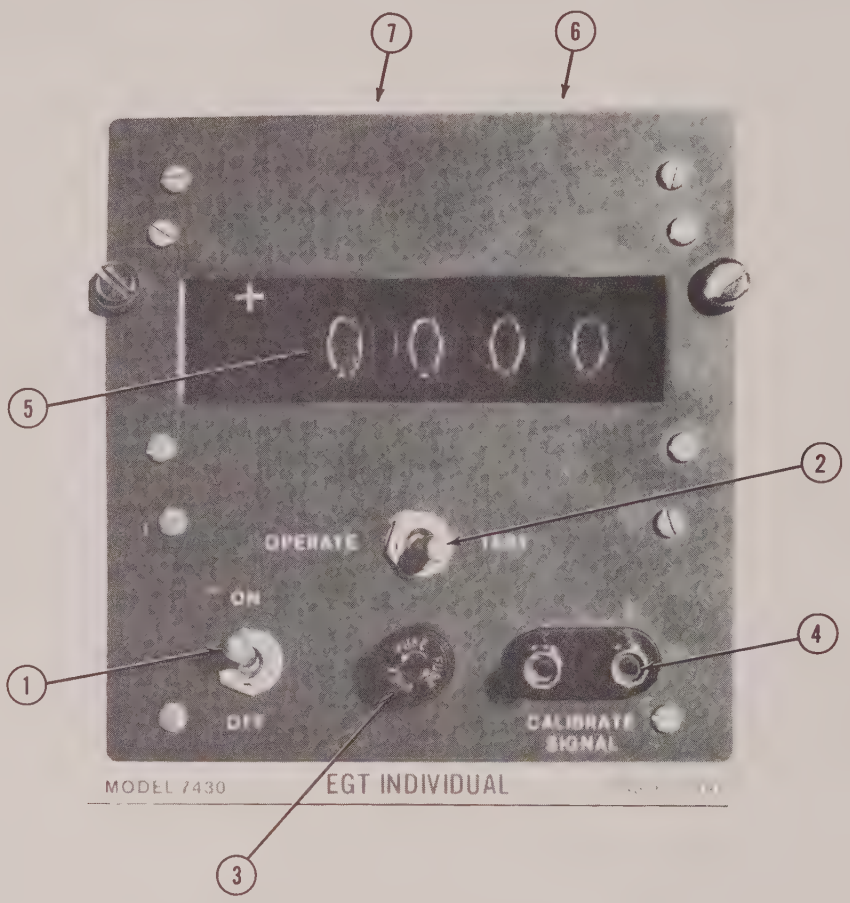
This technical manual is provided to assist overhaul maintenance personnel in troubleshooting; disassembly; cleaning; inspection, repair and replacement; assembly; and testing of the Model 7430 EGT indicator. This technical manual also contains an illustrated parts breakdown to aid in parts identification, requisitioning and replacement.

SECTION I

1-1. GENERAL.

1-2. The EGT indicator Model 7430 is a high speed self contained digital temperature indicator. It incorporates a built in reference junction that automatically displays the temperature of an attached thermocouple to a resolution of one degree Fahrenheit.

1-3. THEORY OF OPERATION. The EGT instrument Model 7430 accepts the millivolt output of a Type K, chromel alumel thermocouple and provides a digital display of the equivalent temperature in degrees Fahrenheit. The instrument is equipped with an internal reference junction which accepts the millivolt output of a thermocouple and provides a digital display of the equivalent temperature. Since the voltage generated by a thermcouple is a non-linear junction of temperature, the analog-to-digital converter circuit in the Model 7430 is made non-linear to match the thermocouple curve. An internal referenced junction provides the interface between the thermocouple and input amplifier. Incorporated within the amplifier circuitry is a three pole filter for high noise rejection. The comparator section utilizes a fixed time interval to compare the output of the amplifier section to power supply generated output and sends a controlling signal governed by the integrating capacitor to the oscillator section. A digital linearization technique is used incorporating a Binary-Frequency-Generator (BFG) controlled by a read-only-memory (ROM). The output of the BFG serves as a clock source for the analog-to-digital converter. The 6 bit binary coded digital input to the BFG is derived from six of the eight parallel outputs of the ROM. The remaining bits are used to select the segment lengths for a thermocouple type. The five bit segment counter is advanced at intervals of degrees determined by the ROM and derived from display counter. Each segment is represented by one 8 bit word in the ROM. Segments corresponding to positive and negative temperatures if any, occur in different sections of the ROM and are selected by a polarity indicating logic level.



Nomenclature	Type of Component	Purpose
1. Power Switch On-Off	Toggle Switch	Energizes circuit
2. Operate/Test Switch	Toggle Switch	Selects test or operate position
3. Fuse	Fuse	.25 Amp. slo-blo portects circuit
4. Calibration signal	Input Jacks	Use for millivolt input during calibration
5. Nixie View Window	-	-
* Pot Zero	Potentiometer	Used to zero instrument
*Pot Span	Potentiometer	Used to adjust instrument span
** Display Time	Toggle Switch	Used to adjust display time 1/2, 1, or 2 sec.

* Located on top of case (not on instrument face)
** Located at rear of instrument

Figure 1-1. Instrument Face Description.

EGT INDICATOR MODEL 7430

Input	Chromel Alumel, Type K, Thermocouples Zero degrees Fahrenheit reference junction
Range	0°F - +2400°F
Accuracy	±1.5°F @ 75 ±5°F Ambient ±2.5°F @ 20-70°F, 80-130°F
Sampling Rate	Compatible with Display Time
Controls	Power Switch, Operate/Test Switch, Zero and Span Potentiometer
Power	115 VAC 50 - 400 Hz
Cable Connections	Temperature Input MS3106-10SL-4S (J337) Power Input MS3106-14S-7S (J338)
Warm Up Time	Rated Accuracy ±1°F within 5 minutes after power is applied @ 75°F, ±2°F, after 15 minutes at high or low ambient temperatures
Repeatability	±1°F for 30 minutes at constant temperature
Display	0.6'' high numerals, glow discharge type with polarized view screen
Display Time	Fast-Medium-Slow selector switch provides 1/2, 1 or 2 second nominal display periods
Settling Time	2 seconds to within one count after a full-scale step input
Long Term Stability	In excess of 300 hours
MTBF	In excess of 363 hours

Figure 1-2. Leading Particulars.

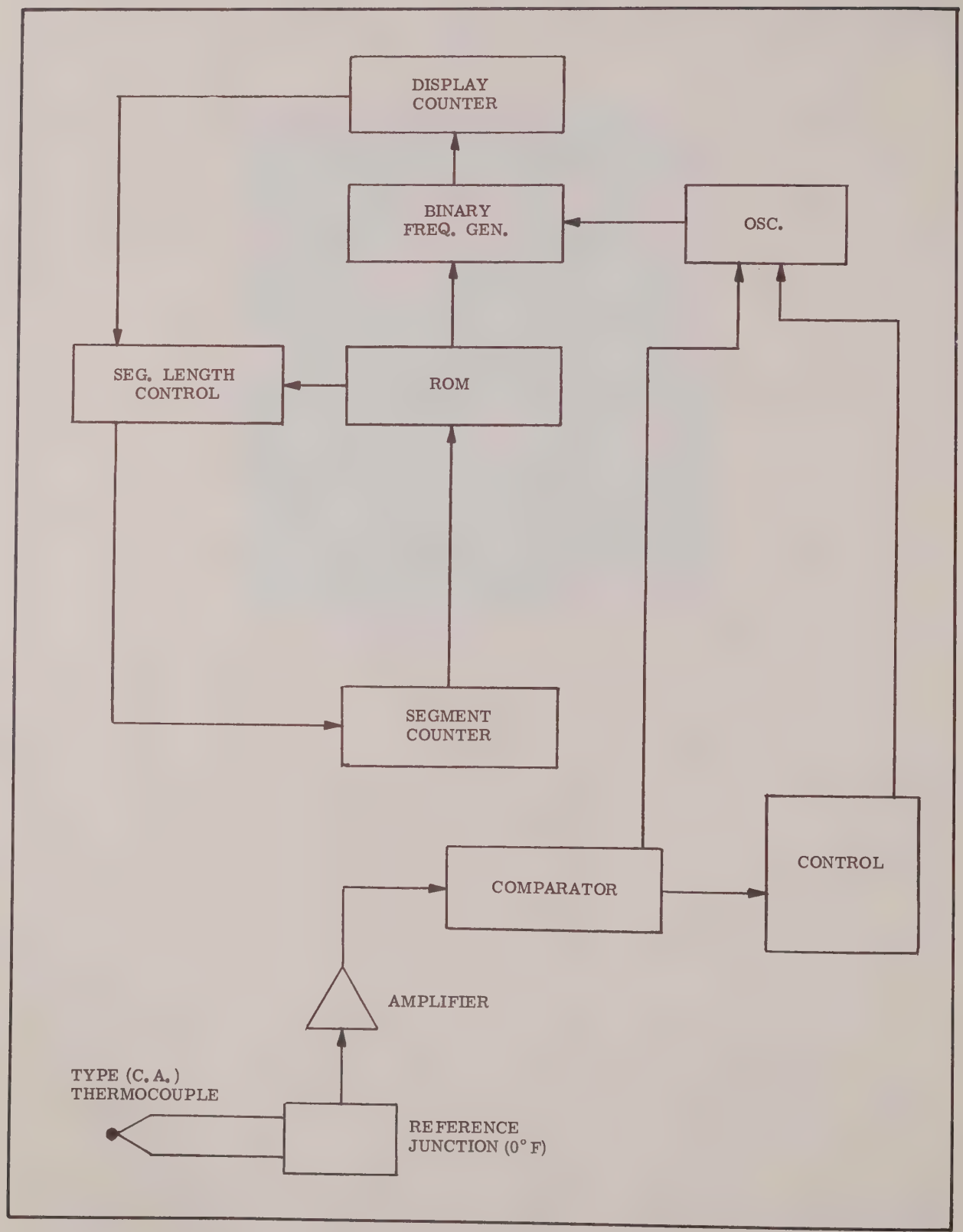


Figure 1-3. Block Diagram, Model 7430.

SECTION II

SPECIAL TOOLS AND TEST EQUIPMENT

2-1. No special tools are required for overhauling the EGT indicator Model 7430.

2-2. The following test equipment is required for testing the instrument:

Nomenclature	Model	Application	Range	Accuracy
Variable millivolt source	Leed and Northrup Model 8886 or equivalent	Provides simulated thermocouple output signal in millivolt for calibration	-10.1 MV to +100.1 MV	.05
Multi-meter	Simpson 260 PSM 6	Resistance checks		
Oscilloscope	Tectronic Model 453 or 500 series with 10 to 1 probe	Test pattern trouble-shooting	-	-

SECTION III

DISASSEMBLY

3-1. DISASSEMBLY.

3-2. Disassembly of the EGT instrument is accomplished in the following manner:

a. Disconnect power and temperature cable J338 and J337.
b. Place "operate/test" switch in operate position.
c. Place power switch in off position.
d. Remove six screws securing the bottom cover plate (1).
e. Remove nuts retaining zero and span adjustment potentiometer, (1 and 2), Figure 3-1 located on top cover plate of instrument.

NOTE

When removing potentiometer retainer nuts hold the potentiometer to prevent damage.

f. Remove four screws securing the top cover plate, (3), Figure 3-1.
g. Remove power input leads (1), Figure 3-2.
h. Remove chromel alumel leads (2), Figure 3-2.
i. Remove hi and lo input leads (3), Figure 3-2.
j. Remove two nuts securing connector J-1 and remove connector, Figure 3-2.
k. Remove four screws (1), Figure 3-3, securing the digital indicator to the instrument package face plate, and slide indicator out of instrument package, Figure 3-3.
l. Remove digital indicator by sliding to either side.

3-3. Disassembly of the digital indicator is accomplished in the following manner:

a. Remove clamp (4), Figure 3-2 from rear of digital indicator.
b. Remove four screws (5), Figure 3-2.
c. Hold rear plate of the digital indicator and slide case over circuit boards.

CAUTION

Both circuit boards have to be removed simultaneously as the ribbon type interconnecting wiring cable (1), Figure 3-4, is soldered to each board.

d. Remove two insulators from indicator case.
e. If "Nixie" digital readout tube(s) are broken or defective, remove from board.

NOTE

Serial Nos. 001-0014 have Nixie tube(s) soldered to board. All higher serial numbers have socket mounted "Nixie" tubes.

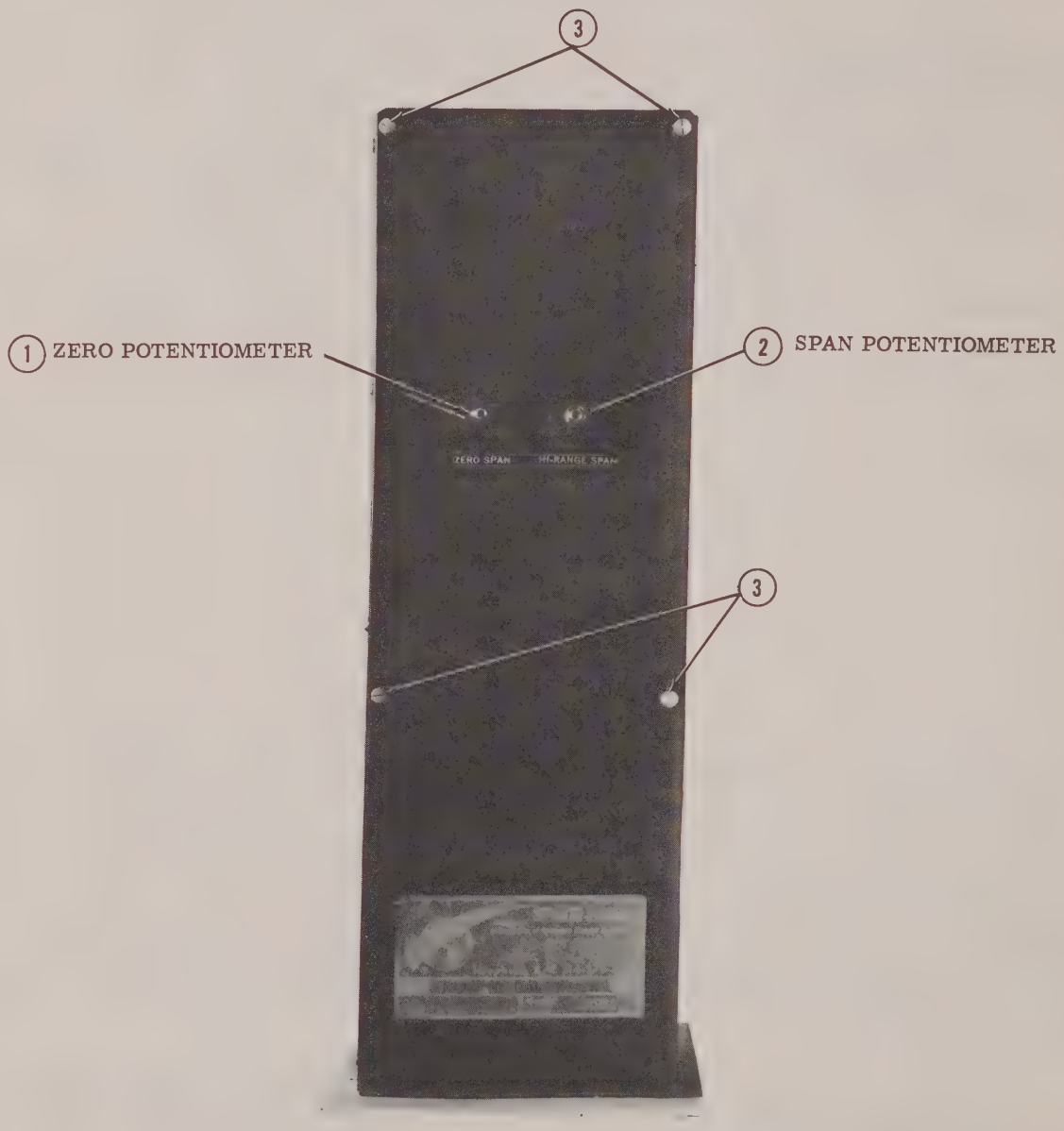


Figure 3-1. Top View, EGT Individual.

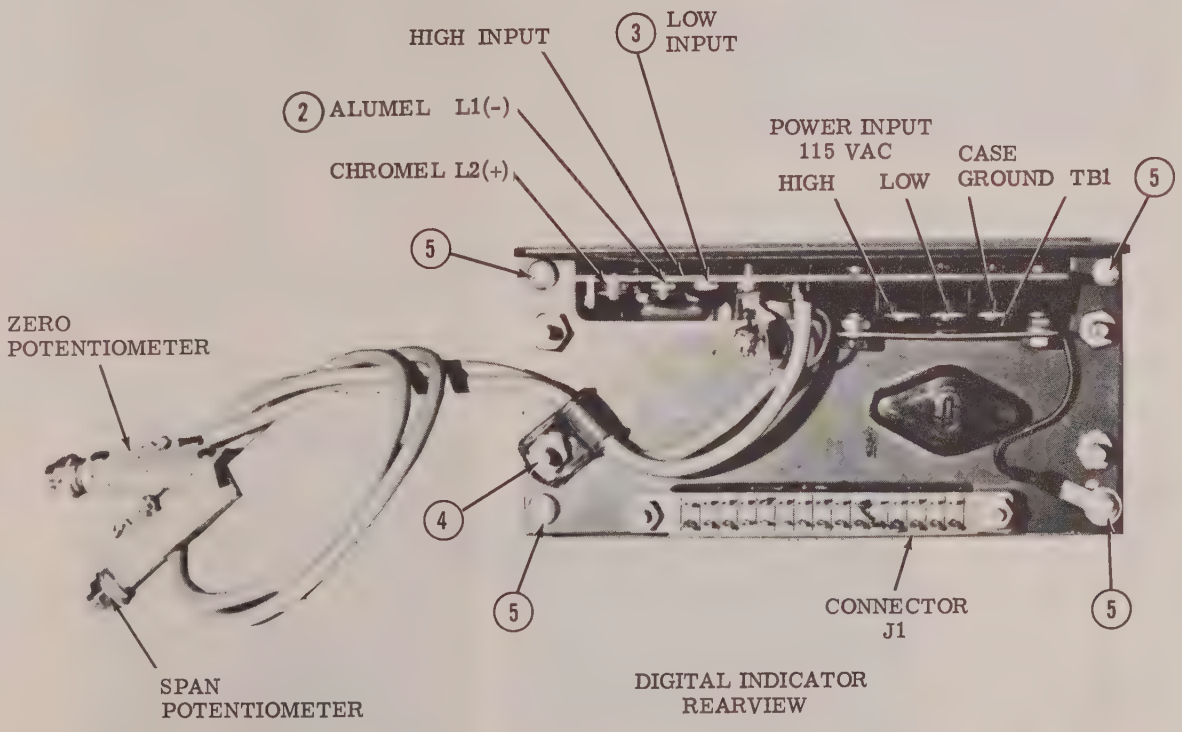


Figure 3-2. Digital Indicator, Rear View.

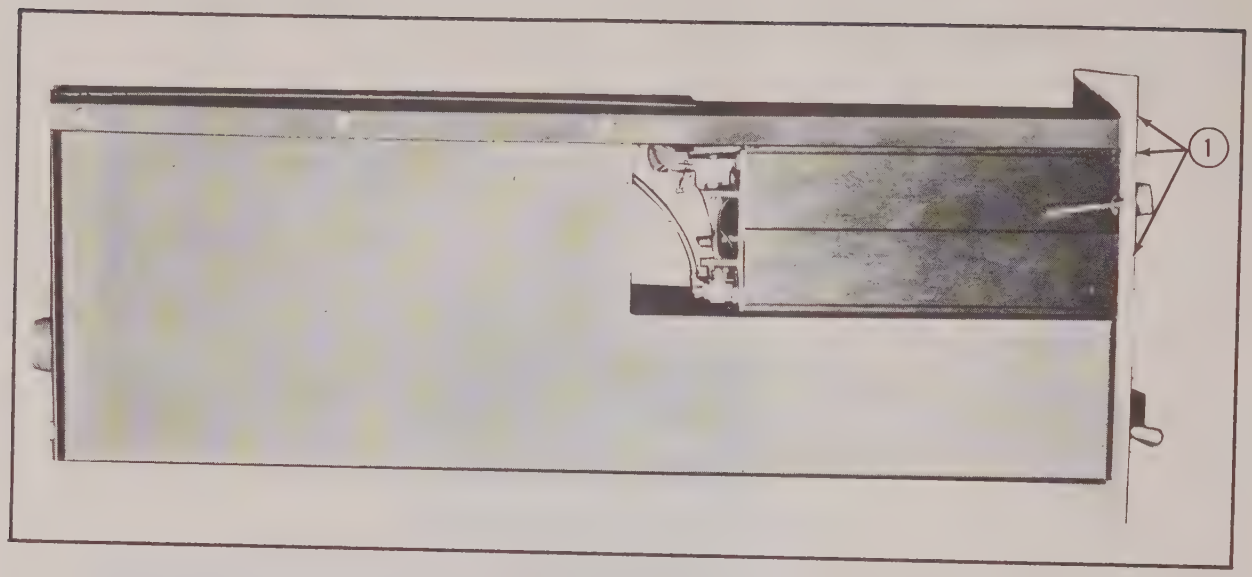


Figure 3-3. Digital Indicator Installed, Side View.

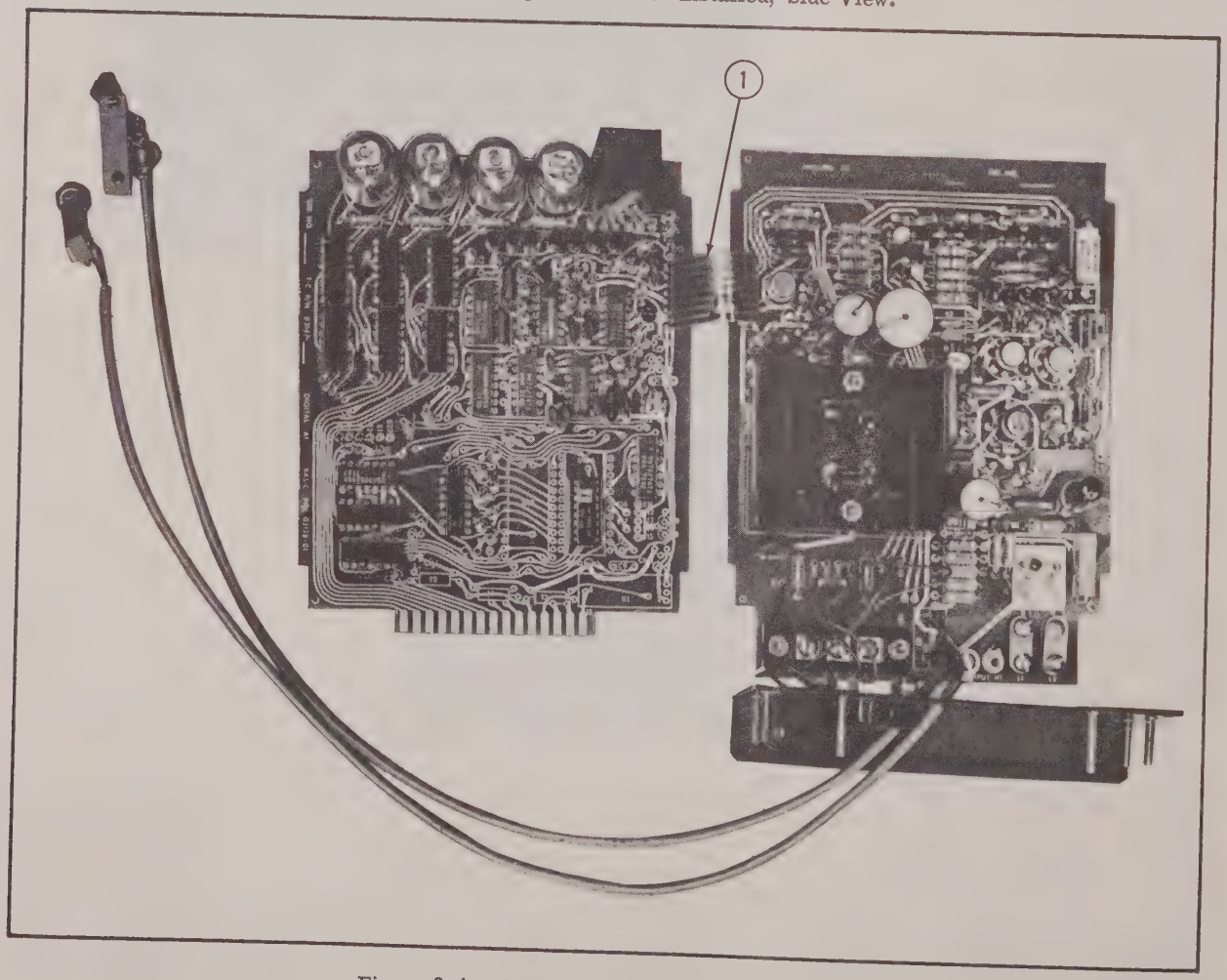


Figure 3-4. Digital Indicator Circuit Boards.

SECTION IV

CLEANING

4-1. CLEANING.

a. Remove surface dirt and oil from formed metal parts with a clean cloth dampened with cleaning solvent, Federal Specification P-S-661. Dry parts with filtered compressed air, and remove solvent film from all surfaces with ethyl alcohol.

CAUTION

Do not allow solvent to come in contact with electrical parts.

CAUTION

When using filtered compressed air for cleaning do not exceed 10 psi.

b. Clean connectors by first removing dust with filtered compressed air. Then wash with a stiff bristled brush dipped in cleaning solvent. Rinse connectors with ethyl alcohol and dry thoroughly with filtered compressed air.

CAUTION

Do not use metal tools to remove foreign matter from connectors as damage to plating may result and cause corrosion. Existing corrosion indicates the necessity for replacement of the connectors.

c. Clean circuit boards with a stiff bristled, nonmetallic brush dipped in ethyl alcohol and dry with filtered compressed air.

NOTE

The boards have been treated for moisture and fungus resistance using varnish MIL-V-173.

SECTION V

INSPECTION, REPAIR AND REPLACEMENT

5-1. INSPECTION.

5-2. Figures 5-1 and 5-2 contain information for inspection and troubleshooting of the Model 7430 EGT instrument.

Part	Inspection
Instrument Case - Indicator Case	Cracked, or damaged, excessive dirt, corrosion
Connectors	Chipped, cracked or shorted
Switches	Signs of loose connections, loose or bent terminals
Potentiometers	Open or shorted
Nixie Tubes	Signs of loose connections, cracks
Inline Circuits	Physical damage
Terminal Block	Cracks, loose connections
Viewing Window	Cracks, distortion

Figure 5-1. Inspection Details

Trouble	Probable Cause	Remedy
Inoperative	Defective power cable or switch	Check for power starting at source
	Instrument fuse open	Replace fuse, .25 amp slo-blo
	Indicator fuse open	Replace fuse, .25 amp slo-blo
	Defective power supply located on analog (A2) circuit board	Refer Figure 7-2 for voltage test points. Repair or replace analog circuit board
Nixie tubes fail to illuminate	Defective power supply located on analog (A2) circuit board	Refer Figure 7-2 for voltage test points. Repair or replace analog circuit board
	Defective diode CR3	Test diode. Replace if necessary
	Defective interconnecting strap	Check strap connections for continuity
One digit fails to light Example DS3	Defective integrated circuit Example U3 or U6	Test U3 and U6. Replace defective circuit
	Defective nixie	Replace nixie
DS4 nixie fails to light	Defective nixie	Replace nixie
	Defective integrated circuit U7	Test U7. Replace if necessary
One number in the DS4 nixie fails to light Example 1	Defective transistor. Example Q5	Test transistor. Replace if necessary
	Defective integrated circuit U7	Test U7. Replace if necessary
Error light DC5 fails to light	Defective thermocouple lead or thermocouple	Check thermocouple wiring. Replace thermocouple
	Defective transistor Q4	Test transistor. Replace if necessary
	Defective integrated circuit U9	Test U9. Replace if necessary.
Defective DS7, DS6 polarity nixie	Defective nixie	Replace nixie
	Defective transistor Q2 or Q3	Test Q2 and Q3. Replace if necessary
	Defective integrated circuit U9	Test U9. Replace if necessary
	Defective transistor Q1	Test Q1. Replace if necessary
Erratic temperature indication	Defective reference thermocouple	Replace reference thermocouple
	Lead broken at R13 or R43	Repair lead
	Defective ROM integrated circuit	Replace ROM integrated circuit U18 - Replace with U18A and install following jumper wires: E16 to E12, E17 to E15, E19 to E20
Ineffective zero or span adjustment during final calibration	Open or short in zero or span potentiometer	Test potentiometer. Replace if necessary
	Defective indicator alignment	Refer to alignment procedures for corrective action

Figure 5-2. Troubleshooting Chart (Sheet 1 of 2)

Trouble	Probable Cause	Remedy
Defective clock inhibit signal (pattern size not corresponding to temperature increase, decrease)	Defective transistor in comparator circuit	Test transistor. Replace if necessary
	Defective integrated circuit U12	Replace U12
Test defective pattern at C16	Defective transistor Q12 or Q13	Test transistor. Replace as necessary
	Defective integrating capacitor C16	Test C16. Replace as necessary
	Defective integrated circuit U 11	Replace U 11
Instrument indicates temperature readings at 1/2 second interval regardless of time delay switch position	Defective time delay switch	Test switch. Replace if necessary
	Defective resistor located on switch	Test resistor. Replace if necessary
	Defective solder joint	Resolder connection

Figure 5-2. Troubleshooting Chart (Sheet 2 of 2)

SECTION VI

ASSEMBLY

6-1. ASSEMBLY

6-2. Alignment Procedures. Following any component replacement on the two circuit boards an alignment of the indicator is required. The following steps should be followed in their entirety:

a. Check power supply voltages A2 Analog Circuit Board.

(1). +5 VDC ± 5%
(2). +24 VDC ± 5%
(3). +12 VDC ± 5%
(4). -12 VDC ± 5%

b. Check for correct error indication in both polarities for the thermocouple installed.

+ Full Scale +2480 utilizing a DC millivolt source
- Full Scale -2480 open circuit

c. Preamp Zero A2 Analog Circuit Board

(1). Apply a short to the input, across R6 and across R16 and R15. Monitor the output of U-1 pin 6 and adjust R18 for an output indication of less than 100 microvolts. Remove shorts from R14, R15 and R6. Adjust R15 for an output indication of less than 100 microvolts.

c1. Preamp Zero A2 Analog Circuit Board (for serial numbers 015 and subsequent)

(1). Monitor the output of U2, pin 6 and adjust R27 for an output indication of less than 100 microvolts.

d. Calibration A2 Analog Circuit Board

(1). Apply an input of +20 degrees. Adjust R31 for a readout of +20 degrees.
(2). Apply an input for a readout indication near full scale. Adjust R43 until the readout is the required indication.
(3). Repeat steps 1 and 2 and adjust R31 and/or R43 until the readout is near the typical conformity values indicated in the tables. Use R31 to adjust near zero (20 to 1000 degrees) and R43 for the full scale.

d1. Calibration A2 Analog Circuit Board

(1). Apply an input of +20 degrees. Adjust R52 for a readout of +20 degrees.
(2). Apply an input for a readout indication near full scale. Adjust R66 until the readout is the required indication.
(3). Repeat steps 1 and 2 and adjust R52 and/or R66 until the readout is near the typical conformity valves indicated in the tables. Use R52 to adjust near zero (20 to 1000 degrees) and R66 for the full scale.

e. Reference Junction Calibration A2 Analog Circuit Board.

(1). Adjust R22 until the voltage across R23 is 4.99 VDC ± 1%

6-3. .Display Time Switch, Figure 1-1/7-3.

a. With switch in the fast position a circuit is completed between contacts 2 and 4 with a time span of approximately 1/2 second.
b. With switch in the medium position a circuit is completed between contacts 2 and 6 with a time span of approximately 1 second.
c. With switch in the slow position a circuit is completed between contacts 2 and 3 with a time span of approximately 2 seconds.

6-4 Reassemble in reverse order of disassembly. (See Section III).

SECTION VII

TESTING

7-1. TESTING.

7-2. After reassembly, calibrate the EGT instrument.

7-3. CALIBRATION. The EGT instrument shall be recalibrated every ninety days. The following procedure is required:

a. Connect the instrument to a power source of 115 VAC 60 Hz, (Reference wiring diagram to J338).
b. Connect millivolt source to the calibration input terminals located on instrument face or connector J337 located at the rear of the instrument. Reference wiring diagram.
c. Place power switch to the on position and operate/test switch in operate position and allow 15 minutes for the instrument to stabilize.
d. Refer to NBS (1971) millivolt/temperature charts for chromel alumel Type K thermocouples, for proper millivolt inputs or use table paragraph g.

NOTE

Instrument will read approximately -2480 and "error" will be displayed until connected to a proper thermocouple or millivolt vource.

e. Using a millivolt source with a reference junction compensator set thermocouple output to 0000 and adjust compensator until instrument reads 0000. Apply a signal equivalent for 300°F, adjust the zero potentiometer until the indicator reads 300°F ±1°F.
f. Apply a voltage equivalent for 2400°F. Adjust the span potentiometer until the indicator reads 2400°F ±1°F.
g. The following are suggested test and calibration points.

(1). Chromel alumel Type K thermocouple - Calibration data to 1971 NBS Monograph 125 (superseding NBS Circular 561).

Degrees	Input Millivolts
300	6.784
600	13,546
1000	22.943
1800	41.267
2400	53.631

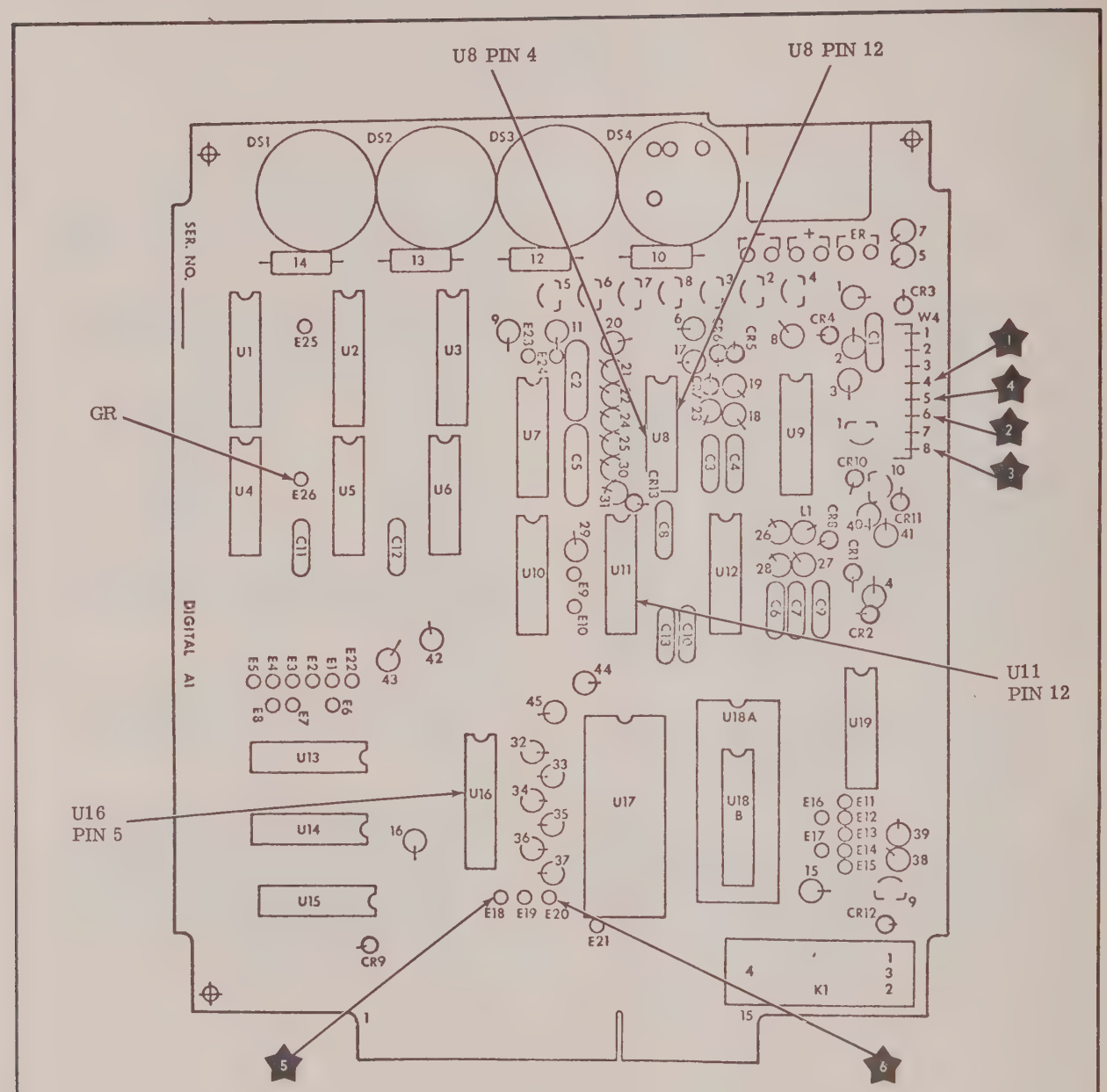
h. Switch operate/test switch to "test" position. Indicator self test circuit will cause indicator to display 0000 ± 1°F.

NOTE

Switch in test position switches off input(s) from rear connector and front calibration jack.

NOTE

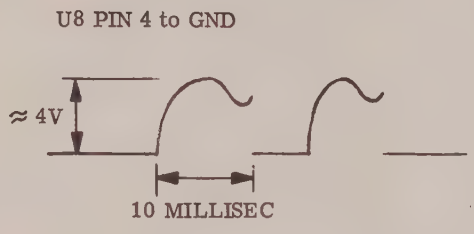
Final calibration of the instrument should be accomplished with the instrument installed in the console. Application of the thermocouple calibrate signal through the test stand cable will permit system calibration that compensates for effects of junctions in the cable interconnections.

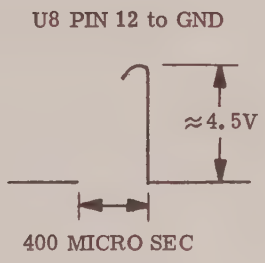


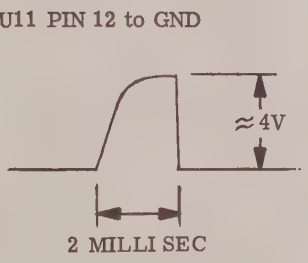
Test Points Digital A1 Circuit Board

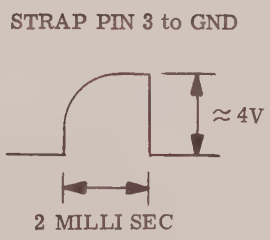
1. W4-4 to E26 (Gr) + 250VDC
2. W4-6 to E26 (Gr) + 10 VDC
3. W4-8 to E26 (Gr) - 12 VDC
4. W4-5 to E26 (Gr) + 5 VDC
5. E18 to E26 (Gr) + 5 VDC
6. E20 to E26 (Gr) - 12 VDC
7. U16 Pin 5 to E26 (Gr) - Test Pattern
8. U11 Pin 12 to E26 (Gr) - Test Pattern
9. U8 Pin 12 to E26 (Gr) - Test Pattern
10. U8 Pin 4 to E26 (Gr) - Test Pattern

Figure 7-1. Test Points, Digital A1 Circuit Board (Sheet 1 of 2).









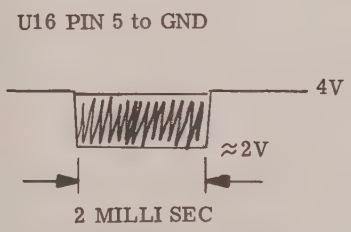
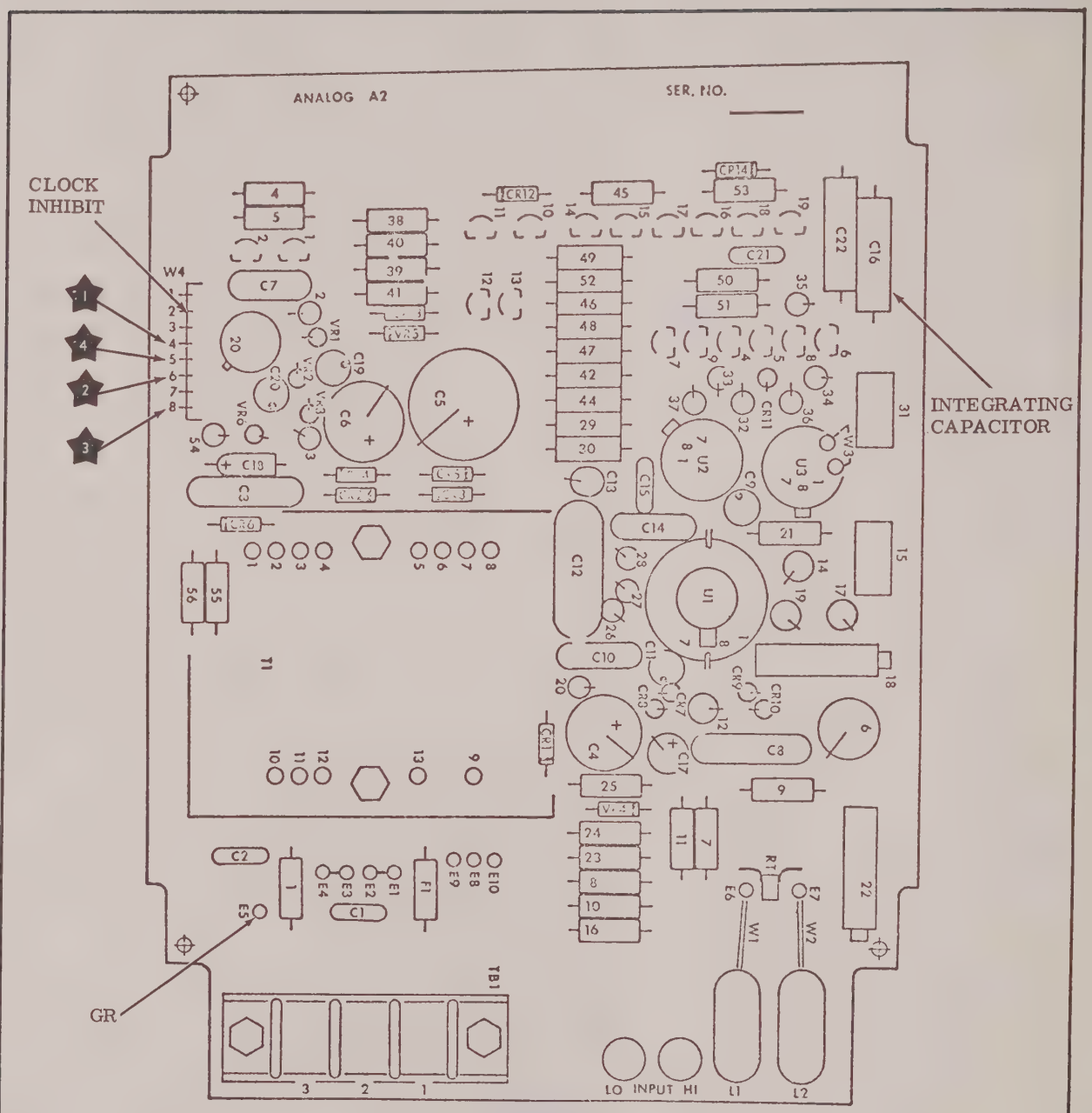


Figure 7-1. Test Points, Digital A1 Circuit Board (Sheet 2 of 2).



Test Points Analog A2 Circuit Board

1. W4-4 to E5 (Gr) + 250V
2. W4-6 to E5 (Gr) + 10V
3. W4-8 to E5 (Gr) - 12V
4. W4-5 to E5 (Gr) + 5V
5. W4-2 (clock inhibit) to E5 (Gr) - Test Pattern
6. C16 (integrating capacitor) to E5 (Gr) Test Pattern

Figure 7-2. Test Points Analog A2 Circuit Board (Sheet 1 of 2).

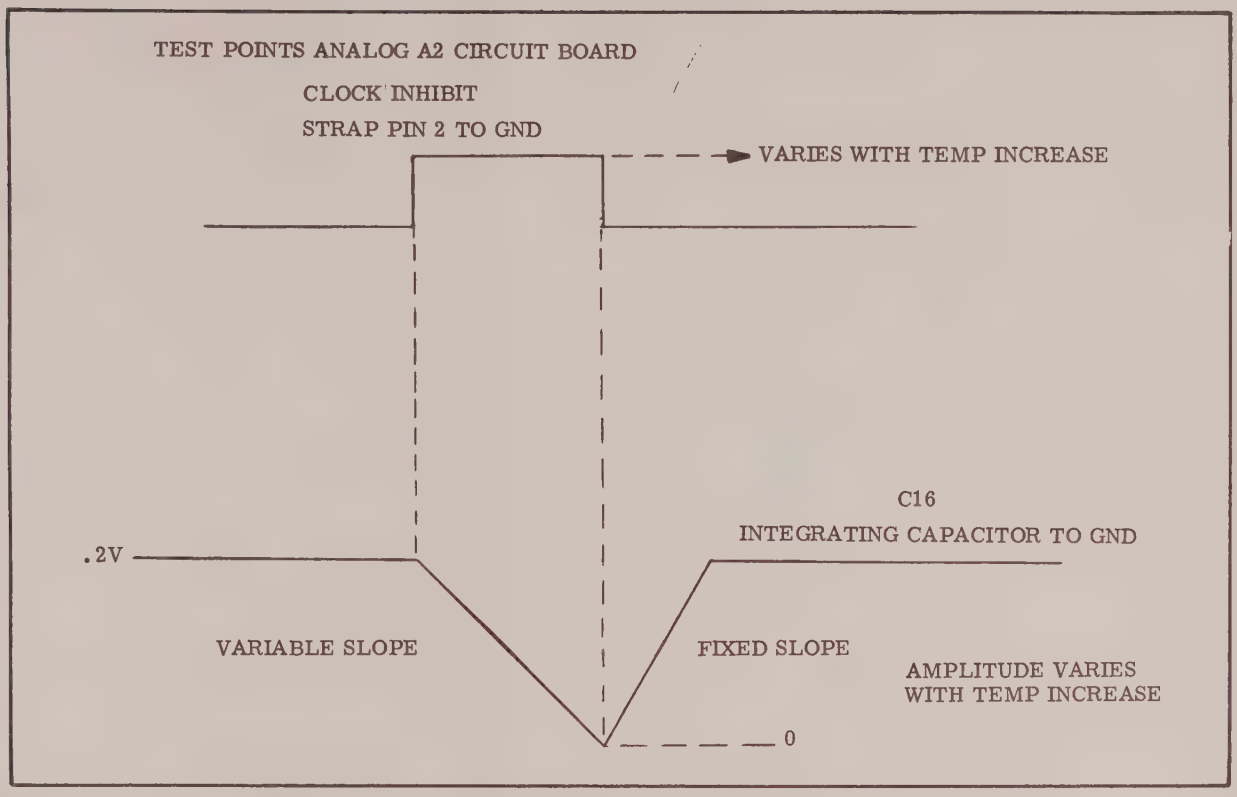


Figure 7-2. Test Points Analog A2 Circuit Board (Sheet 2 of 2).

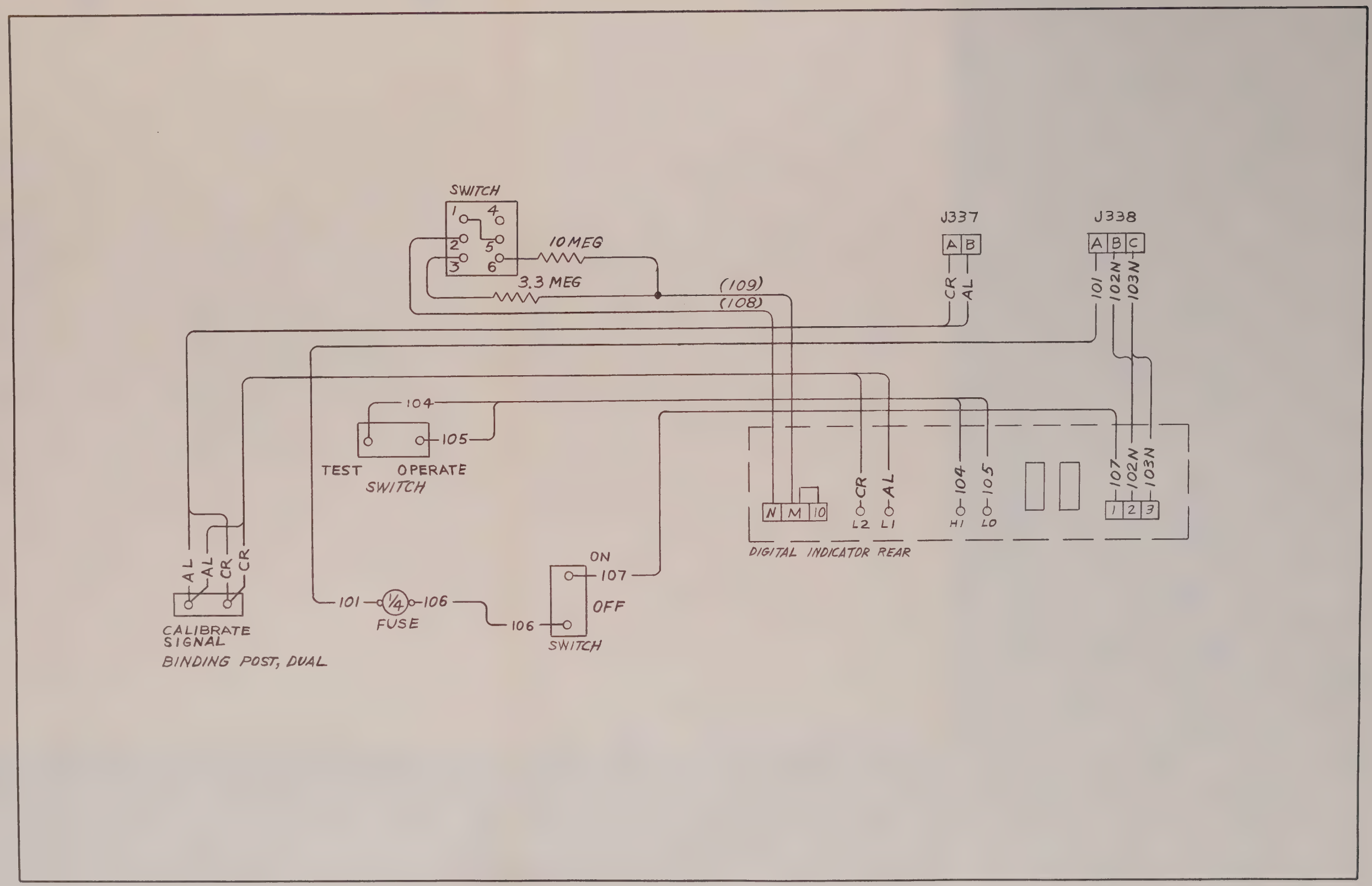


Figure 7-3. Wiring Diagram.

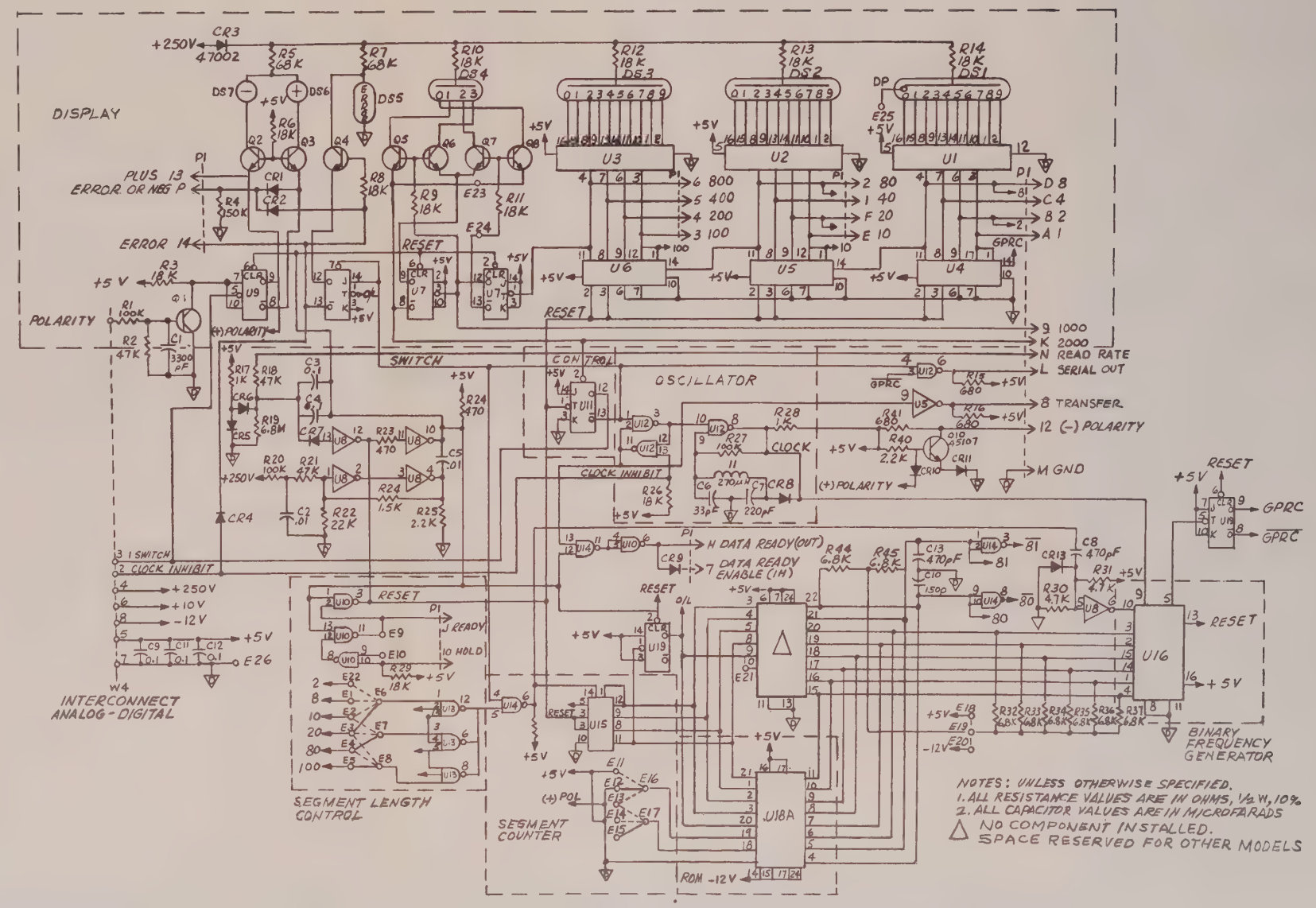


Figure 7-4. Digital A1 Circuit Board Schematic.

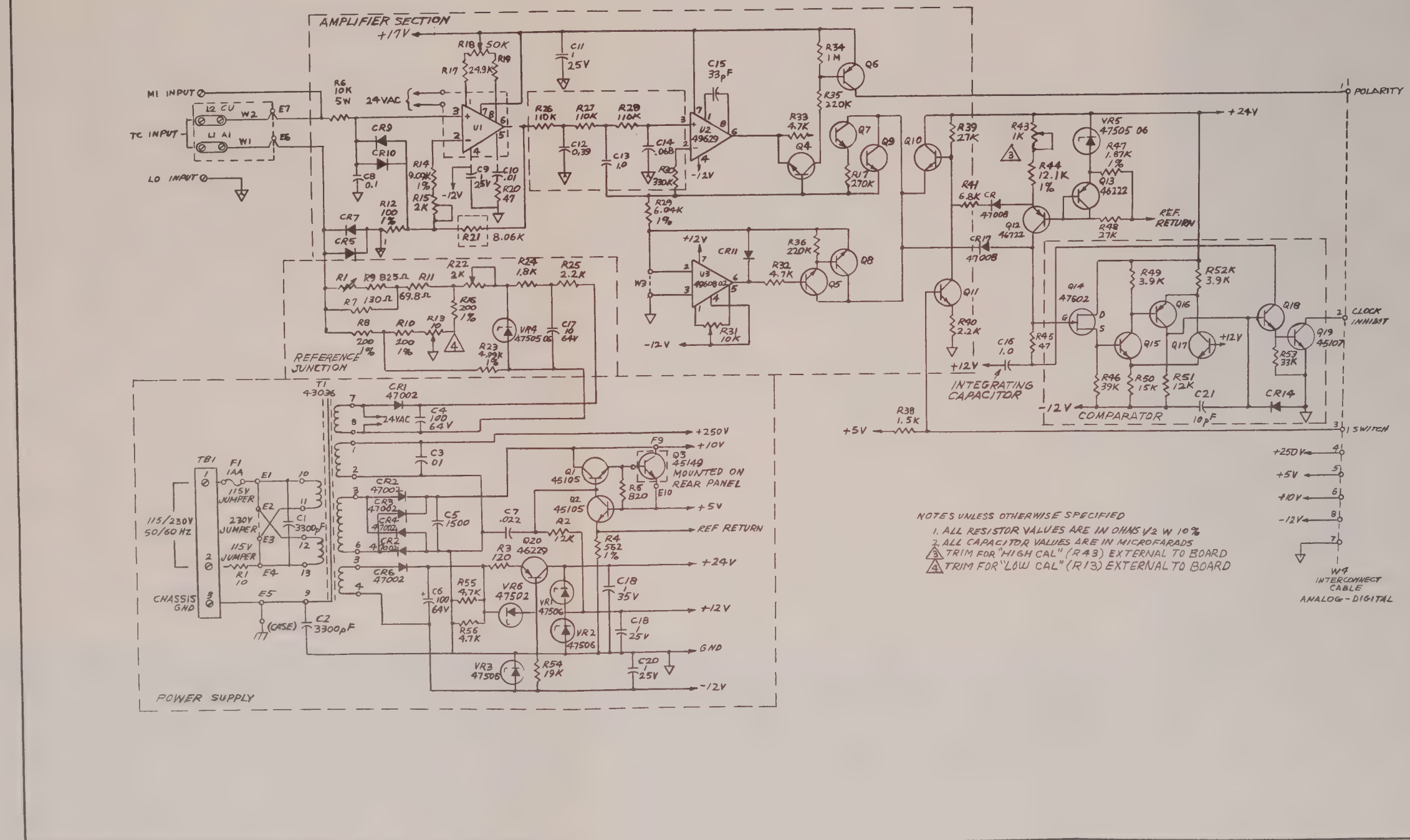


Figure 7-5. Analog Circuit Board Schematic.

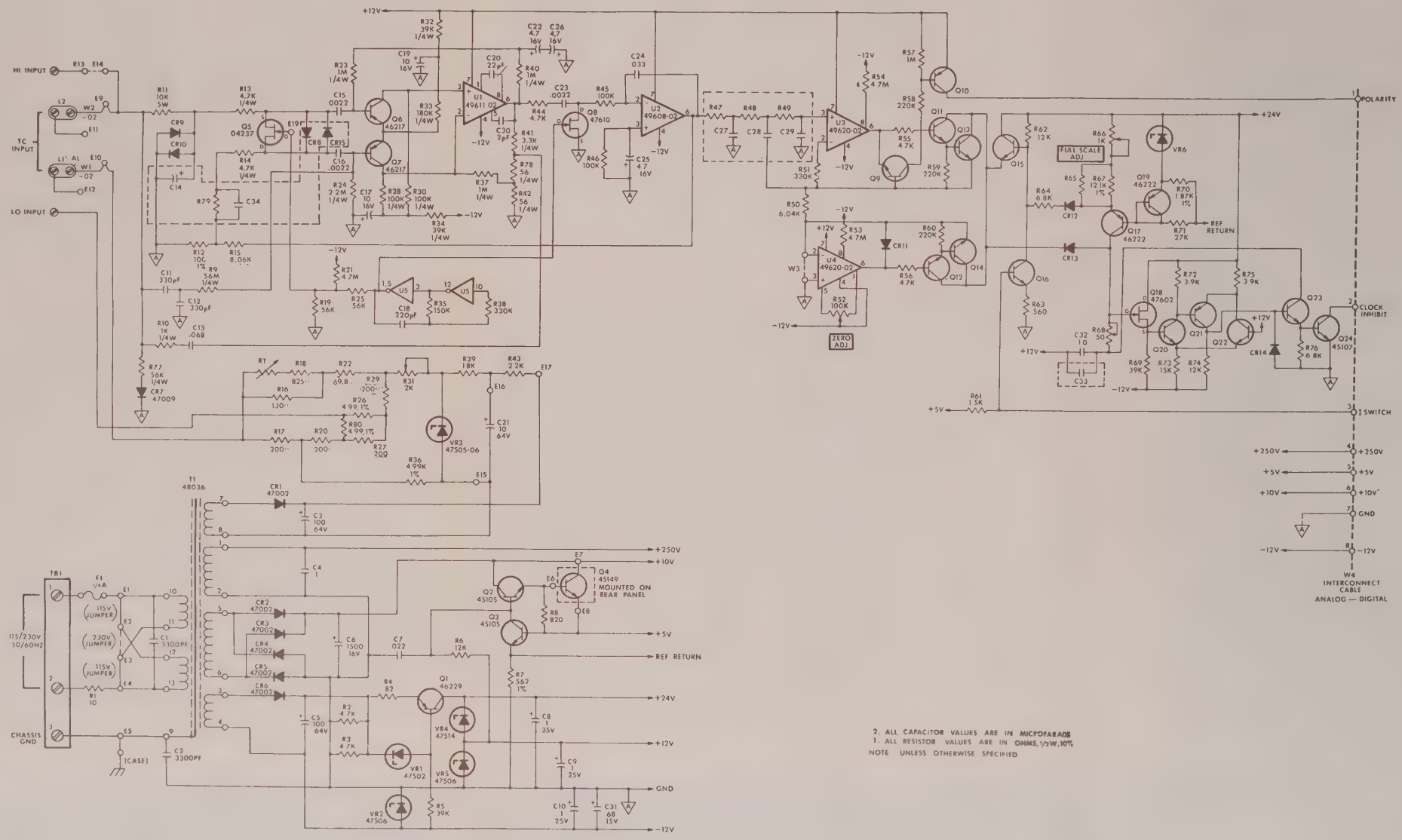


Figure 7-6 Schematic Diagram (for serial Nos. 015 and subsequent)

SECTION VIII

INTRODUCTION

8-1. GENERAL. The following paragraphs contain information, explanation of symbols, abbreviations, definitions of applicable source and reparability codes, a list of vendor names and addresses.

8-2. HOW TO USE THE ILLUSTRATED PARTS BREAKDOWN. Use of the Illustrated Parts Breakdown depends upon the information known when reference is made to the manual. If the component part number is not known, see paragraph 8-3.

8-3. USE OF THE ILLUSTRATED PARTS BREAKDOWN WHEN THE COMPONENT PART NUMBER IS NOT KNOWN. When the component part number is not known, the part may be identified by the following procedure:

a. Determine the major assembly in which the component part is used.
b. Refer to the Table of Contents for the page number on which the major assembly is illustrated.
c. Use the illustration of the major assembly to determine whether the component part is an item of major assembly or of a subassembly. If the unknown component part is used on the major assembly, locate the index number in the illustration then refer to the listing for the required component part number. If the unknown component part is used in a subassembly, locate the index number of the subassembly in the illustration and continue with step d.
d. Refer to the major assembly listing to locate the illustration in which the subassembly is broken down, then locate the unknown component part in the subassembly breakdown.

8-4. ABBREVIATIONS. All abbreviations used in this manual are in accordance with MIL-STD-12.

8-5. GROUP ASSEMBLY PARTS LIST.

8-6. GENERAL. The Group Assembly Parts List contains a breakdown of the equipment into its assemblies and detail parts. Each assembly listed is followed by its component parts properly indented to show relationship to the assembly. An assembly listed in column one has its detailed parts listed in column two. If a component part is in turn an assembly, its detailed parts are listed in column three, etc. Attaching parts are listed below and at the same indentation as the items which they attach. They are captioned (ATTACHING PARTS) and the symbol ---*--- separates them from subsequently listed parts or subassemblies.

8-7. FIGURE AND INDEX NUMBER COLUMN. Each component part is identified by an index number in the illustration which is assigned in order of disassembly and is used in the first column of the listing to cross-reference the delineated component part and the other information given.

8-8. PART NUMBER COLUMN. The second column is used to list the part number of each component delineated in the illustration. Component parts manufactured to military specifications are listed by the part number assigned by the original manufacturer.

8-9. Commercial hardware procurable from normal commercial sources and not identifiable as a government or manufacturer standard part is identified by the symbol "COML".

8-10. When a component part has not been assigned a part number the words "NO NUMBER" appear in the part number column.

8-11. Component parts listed in this manual which are manufactured to military standards have a two or three element prefix to the rest of the part number; the applicable military specification may be determined from the following cross-reference:

Prefix	MIL Specification	Nomenclature
CL	MIL-C-3965	CAPACITOR, Fixed, electrolytic
FHN	MIL-F-19207	FUSEHOLDER
RA	MIL-R-19	RESISTOR, Variable
RC	MIL-R-11	RESISTOR, Fixed, composition
RN	MIL-R-10509	RESISTOR, Fixed, film
RV	MIL-R-94	RESISTOR, Variable
RW	MIL-R-26	RESISTOR, Fixed wirewound
ST	JAN-S-23	SWITCH, Toggle
WM	MIL-C-2486	CABLE, Special purpose, electrical
1N	MIL-E-1	SEMICONDUCTOR DEVICE, diode
2N	MIL-S-19500	TRANSISTOR

8-12. DESCRIPTION COLUMN. The descriptions of the individual component parts are given in the third column, indented where necessary to show relationship to preceding assemblies, subassemblies or detail parts. The major assembly for which the illustration and listing are prepared is always listed under indent 1, component parts listed on the manufacturer's drawing for the major assemble are listed under indent 2. Where a subassembly has been broken down on the same illustration used for a major assembly, and the manufacturer's drawing for the major assembly shows only the subassembly part number, the component parts of the subassembly are listed under indent 3. Where a subassembly has been broken down on a separate illustration the figure number is referenced.

8-13. Attaching parts are listed immediately following the component parts which they secure to the NHA and have the same indention as the attached part or parts. A separation symbol (---*---) follows the listing of the attaching parts to distinguish them from the subsequent listing of other component parts with the same or subordinate indention.

8-14. Commercial vendors are identified by a five digit numerial symbol, paranthetically noted after the description of the applicable part, in accordance with cataloging Handbook H4-1, Federal Supply Code for manufactures. A numerical list of all vendors' codes, with corresponding names and addresses of each manufacturer, is shown at the conclusion of the Introduction.

8-15. UNITS PER ASSEMBLY COLUMN. Identical component parts which may be disassembled in sequence are listed as a group. For example, if a cover is attached by ten identical screws, only one is shown in the illustration and a one line entry is made in the listing; the actual quantity used for that purpose is shown in the fourth column.

8-16. Where a subassembly is broken down in a separate illustration, the quantity of subassemblies used in the major assembly is shown in the listing for the major assembly. The abbreviation REF is used to indicate that reference must be made to the NHA for the desired quantity.

8-17. The abbreviation AR used for indeterminate quantities such as lengths of cable or wire.

8-18. SOURCE CODE COLUMN. Source Codes contained in this publication have been authorized by the Activity responsible for the provisioning supply parts and replacement component parts, to indicate the level of maintenance at which component parts may be requested, installed, purchased and/or manufactured. Policies, general information, and procedures for changing source and maintenance coding are contained in T. O. 00-25-195. Generally, the source codes, and maintenance repair level codes, herein (See Code and Repair Code columns) were assigned by Air Force Personnel when this equipment was purchased.

8-19. CODE "P" - PARTS UNDER INVENTORY STOCK CONTROL. Code "P" identifies parts which may be requisitioned and installed by any level of maintenance consistent with the command's authorized scope of maintenance. Code "P" is applied to parts on which usage is anticipated or known.

a. Code "P" identifies parts which may be requisitioned and installed by AF activities authorized depot-level maintenance only. Restricted service manufacture of "PD" coded parts is considered practicable but may be accomplished only after confirmation of non-availability from supply sources.
b. Code "P1" identifies parts which may be requisitioned and installed by any maintenance level consistent with the command's authorized scope of maintenance. This code is applied to parts which are impracticable to service manufacture.
c. Code "P1D" identifies parts which may be requisitioned and installed by Air Force activities authorized depot-level maintenance only. This code is applied to parts which are impracticable for service manufacture.
d. Code "P2" identifies insurance-type spare parts which can be installed by any Air Force activity consistent with the command's authorized scope of maintenance. This code is applied to such parts which are basically structural and for which no usage is anticipated or known; require special tools, templates, and/or jigs and are very difficult, impracticable, or uneconomical to manufacture by Air Force activities. These items are not subject to periodic replacement as a result of accidents or other unexpected occurrences. Delayed procurement items are included under this code.
e. Code "P2D" identifies insurance-type parts which may be installed by Air Force activities which are authorized depot-level maintenance only. This code is applied to parts as described under Code "P2" and to delayed procurement items.

8-20. CODE "M" - MANUFACTURE, PARTS NOT PROCURED. Code "M" identifies parts, the manufacturer and installation of which is within the capabilities of field maintenance activities, and to which all of the following conditions apply:

a. Procurement is not justified because of low usage or peculiar storage and installation factors. Needs are to be met by local manufacture only as required.
b. Manufacture does not require tools, equipment, or sills not normally authorized at field maintenance level.
c. Does not require test equipment not normally authorized at field maintenance level.
d. Does not require material not normally available in Air Force inventory.

8-21. Code "M1" identifies parts which can be manufactured at activities authorized depot-level maintenance facilities and to which all of the following conditions apply:

a. Procurement is not justified because of low usage or peculiar storage and installation factors. The needs of base activities are to be met by requisitioning from the SSM or IM AMA.
b. Manufacture is beyond capabilities of field maintenance activities as outlined above.
c. Manufacture does not require tools or equipment normally authorized at all AMAs.

8-22. CODE "A" - ASSEMBLE, ASSEMBLY NOT PROCURED.

a. Code "A" identifies items capable of being assembled at any level of maintenance and is applied to assemblies of two or more parts, at least one of which is purchased and carries an individual part number and description.
b. Code "A1" identifies assemblies which can be assembled at Air Force activities authorized depot-level maintenance only and is applied to assemblies described under "A" code.

8-23. CODE "X" - PARTS CONSIDERED IMPRACTICABLE FOR SERVICE MANUFACTURE.

a. Code "X" is applied to main structural members or similar parts, which, if required, would suggest extensive repair. The need for a part or parts coded "X" (wing spars, center section structure, etc.) should normally result in a recommendation to retire the article from service.
b. Code "XI" identifies parts applicable at any level of maintenance consistent with the command's authorized scope of maintenance, and for which procurement of the next higher assembly so coded "P1" is normally justified; for example, an integral detail part such as a welded segment inseparable from its assembly; a part machined in a matched set; or a part of an assembly which, if required, would suggest extensive reconditioning of the assembly. In some cases Code "XI" may be used to indicate an integral detail part of an assembly for which there is no anticipated usage and as an assembly was coded "M" or "M1".
c. Code "X1D" identifies parts described under the "X1" code but which are applicable to Air Force activities authorized depot-level maintenance only.
d. Code "X2" identifies parts applicable at any level of maintenance consistent with the command's authorized scope of maintenance, usage of which is not anticipated and which are impracticable for service manufacture. This type of item will not be stocked. Such parts shall be obtained from reclamation, or requisitioned through normal supply channels with supporting justification for one-time procurement and immediate issue. Repeated requests shall justify a change to a "P1" or "P2" code as applicable if considered economical to procure and stock such parts.
e. Code "X2D" identifies parts described under the "X2" code but which are applicable to Air Force activities authorized depot-level maintenance only. Repeated requests for such parts shall justify a change to a "P1D" or "P2D" code, as applicable, if considered economical and feasible to procure and stock such parts.

8-24. CODE "U" - PARTS NOT PROCURED, MANUFACTURED, OR STOCKED. Code "U" is applied to installation drawings, diagrams, instruction sheets, field-service drawing numbers, and parts not otherwise of supply significance, including obsolete parts, which cannot be procured or service manufactured.

8-25. CODES FOR PARTS KITS:

a. Code "F" - Minor or Field Parts Kit. Code "F" is applied to kits which are available to all maintenance activities authorized to perform base level repair of end item, including overhaul activities in support of field activities.

(1). Code "KF". Code "KF" is applied to items which are components of an F-Kit.

b. Code "D". Code "D" is applied to kits which are available only to thos activities authorized to perform depot level repair.

(1). Code "KD". Code "KD" is applied to items which are components of a D-Kit.
(2). Code "KB". Code "KB" is applied to items which are components of both an F-Kit and a D-Kit.

c. Items which are source coded "KD", "KF" or "KB". and for which the application of such items is peculiar to repair kits, will not be stocked separately and will not be assigned any additional source codes.
d. Items which are source coded "KD", "KF" or "KB", and for which the application of such items is common to repair kits and to other repair or overhaul application, will be stocked separately in the appropriate commodity class if followed by the letter "P".

8-26. MAINTENANCE REPAIR LEVEL CODE COLUMN. The following repair codes, assigned by the activity responsible for provisioning spare and replacement component parts, indicates the applicable organizational level of maintenance anr repair. (See paragraph

8-27. CODE "S" - NO REPAIR. Code "S" identifies items which are non repairable and have no reclamation value. When these items fail they will be disposed of at user level as condemned material.

8-28. CODE "B" - NO REPAIR: RECONDITION. Code "B" identifies assemblies or parts that will be reconditioned at the user level by adjusting, cleaning, soldering broken connection, etc. If these items cannot be returned to serviceable condition by such means they will be disposed of at user level as condemned material. No repair parts or tools are specially procured for maintenance of these items.

8-29. CODE "F" - FIELD LEVEL MAINTENANCE. Code "F" identifies items which will be repaired by the field level maintenance activities. Normal servicing will be done by organizational level maintenance. Selected parts, tools, and technical order data are procured and provided to applicable field level maintenance activities for repair of these items. No SRA is established for these items. If the condition of these items is such that they cannot be returned to serviceable condition by the field level maintenance activity with authorized parts and tools, they will be disposed of as condemned material. If repair of "F" coded items cannot be accomplished due to unavailability of authorized parts, tools, or other capability, the applicable SSM/IM will be so advised with request for disposition instructions. "F" coded critical items, regardless of condition, will be returned to supply for disposition instructions from the applicable SSM/IM.

8-30. CODE "D" - LIMITED FIELD REPAIR: DEPOT OVERHAUL. Code "D" identifies items on which a limited degree of repair can be accomplished by field level maintenance activities. Normal servicing will be done at organizational level. SRA is established for overhaul of these items. A range of repair parts, tools, and technical order data consistent with the capability of repair are procured and provided to applicable field maintenance activities.

Because of the design characteristics and complexity of repair, the degree of repair which is authorized on these items at field maintenance level is necessarily determined by the degree of technical skills required and the cost of special tools, special test equipment, spare parts, and the predicted frequency of failure generation. If these items cannot be returned to serviceable condition with authorized parts and tools they will be returned to supply for shipment to the designated SRA.

8-31. CODE "DM" - LIMITED FIELD REPAIR: MOBILE DEPOT OVERHAUL. Code "DM" identifies items to which all the conditions of Code "D" apply except that repair beyond field capability will be done by the Mobile Depot Activity (MDA). If the MDA cannot repair these items, disposition instructions will be requested from the IM.

8-32. CODE "L" - DEPOT LEVEL MAINTENANCE ONLY. Code "L" identifies items that will be repaired only at designated SRA. Repair parts and tools for repair are procured and provided only to these authorized activities. Required functional checkout and bench check equipment may be provided to applicable organizational and field level; maintenance activities for accomplishing external adjustment or calibration and for verifying serviceability of these items. If they are found unserviceable they will be turned in to supply for shipment to the SRA.

8-33. CODE "LM" - DEPOT LEVEL MAINTENACE ONLY; MOBILE DEPOT ACTIVITY. Code "LM" identifies items to which all conditions of Code "L" apply except that repair will be accomplished by MDA. If MDA cannot repair these items, they will determine whether these items should be condemned or sent to the SRA.

VENDOR'S CODE

Code	Vendor's Name and Address
01295	Texas Instruments Inc. Components Group P. O. Box 5012/13500 N. Central Expwy. Dallas, Texas 75222
01686	RCL Electronics Inc. 195 McGregor Street Manchester, New Hampshire 03102
04713	Motorola Inc. Semiconductor Products Div. 5005 E. McDowell Road Phoenix, Arizona 85008
04984	Space Corp P. O. Box 5175 Dallas, Texas 75222
05397	Union Carbide Corp Materials Sys. Div. 11901 Madison Avenue Cleveland, Ohio 44101
07263	Fairchild Semiconducter - A Division of Fairchild Camera and Instrument Corp. 466 Ellis Street Mountain View, California 94040
08806	General Electric Co. Miniature Lamp Dept. Nela Park Cleveland, Ohio 44112
13715	Fairchild Semiconductor - A Division of Fairchild Camera and Instrument Corp. 4300 Redwood Hwy San Rafael, California 94903
14752	Electro Cube Inc. 1710 S. Del Mar Avenue San Gabriel, California 71776
15238	ITT Semiconductors - Division of International Telephone & Telegraph Corp. 500 Broadway Lawrence, Maine 01841
15801	Fenwal Electronics Inc. 6300 Fountain Street Framingham, Maine 01701
19701	Electra/Midland Corp. P. O. Box 760 Mineral Wells, Texas 76067
27014	National Semi-Conductor Corp. 2950 San Ysidro Way Santa Clara, California 95051
32997	Bourns Inc. Trimpot Products Division 1200 Columbia Avenue Riverside, California 92507
34553	Amperex Electronic Corp Component Div. 35 Hoffman Avenue Hauppauge, New York 11787
56289	Sprague Electric Co. North Adams, Maine 01247
71400	Bussmann Mfg. Division of McFraw-Edison Co. 2536 W. University Street St. Louis, Missouri 63017
72653	G. C. Electronics Co. Division of Hydrometals Inc. 400 S. Wyman Street Rockford, Illinois 61101
73138	Bechman Instruments Inc. Helipot Div. 2500 Harbor Blvd. Fullerton, California 92634
75382	Kulka Electric Corp. 633-643 S. Fulton Avenue Mt. Vernon, New York 10550
75915	Littlefuse Inc. 800 E. Northwest Hwy. Des Plaines, Illinois 60016
79963	Zierick Mfg. Co. Radio Circle Mt. Kosco, New York 10549
81073	Grayhill Inc. 561 Hillgrove Avenue La Grange, Illinois 60525
94222	Southco Inc. Lester, Pennsylvania 19113
99800	American Precision Industries Inc. Delevan Division 270 Quaker Road East Aurora, New York 14052

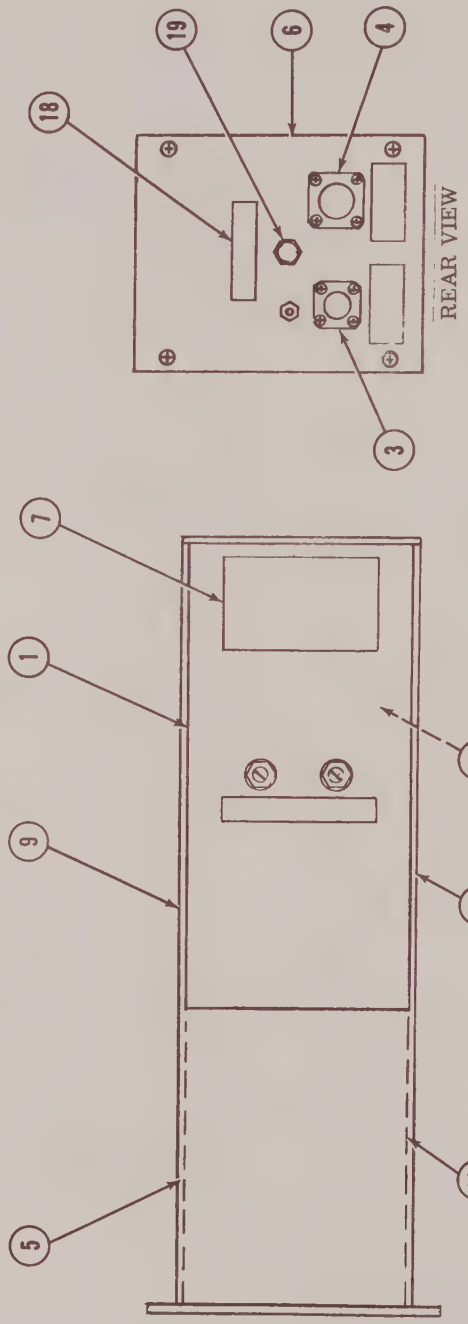


Figure 8-1. Exhaust Gas Temperature Indicator (Sheet 1 of 2).

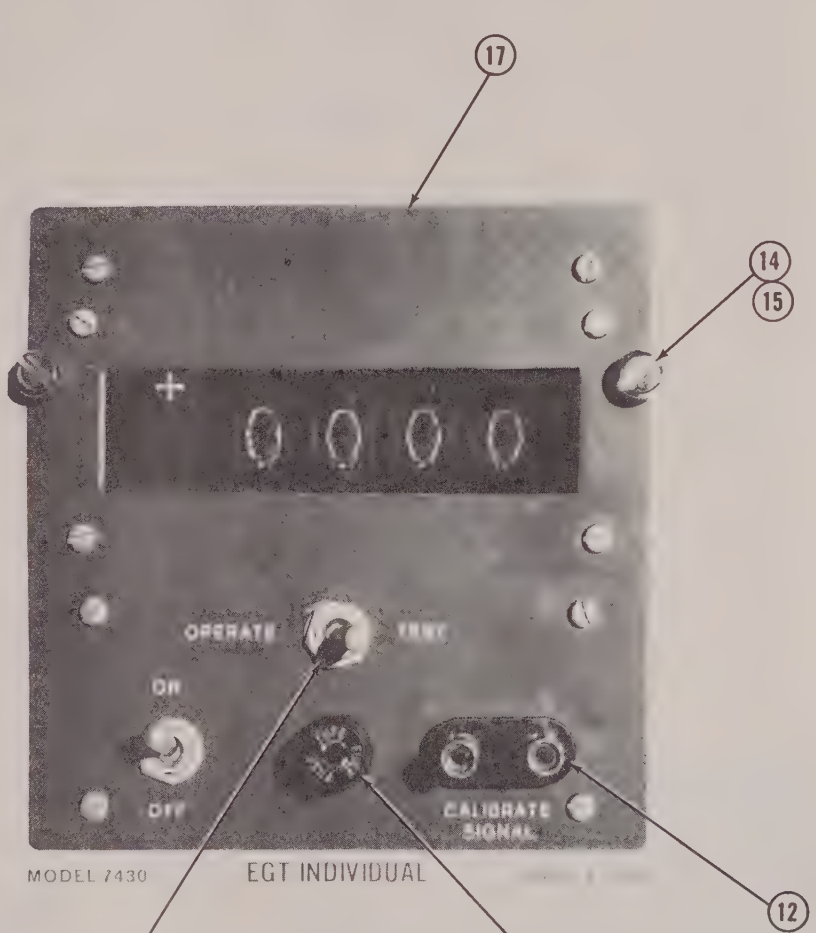
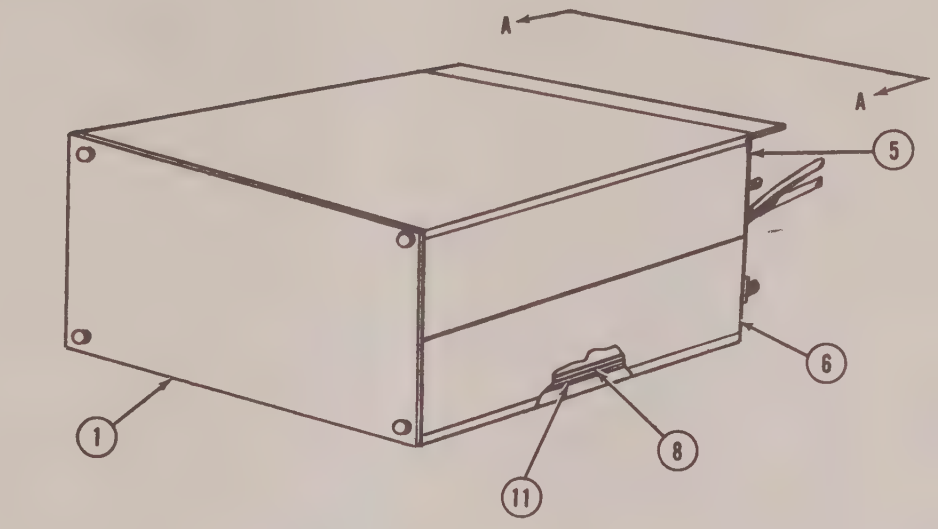
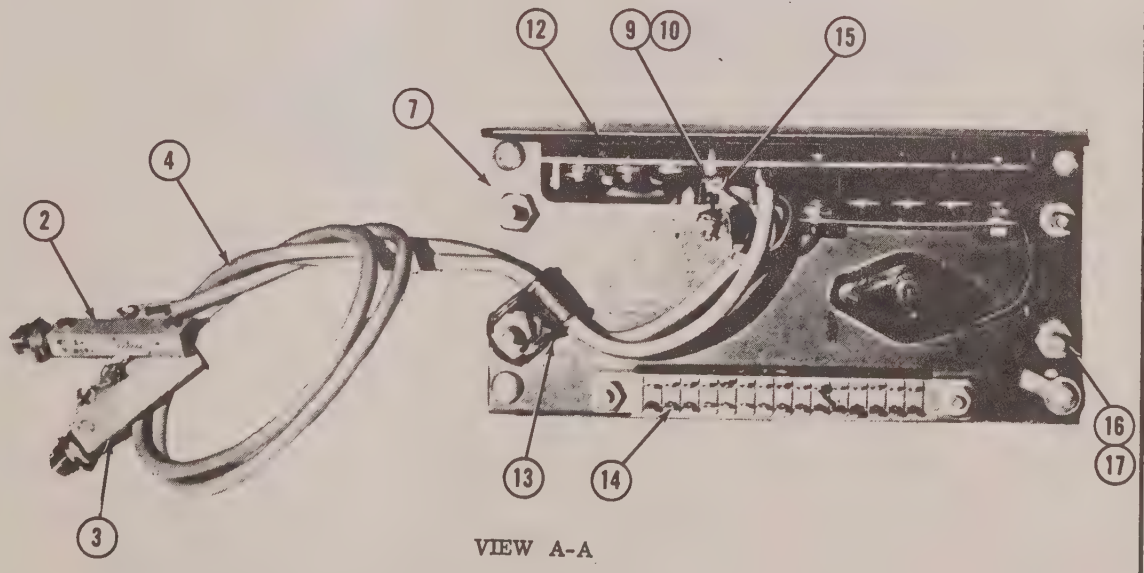


Figure 8-1. Exhaust Gas Temperature Indicator (Sheet 2 of 2).

FIGURE AND INDEX NUMBER	PART NUMBER	1 2 3 4 5 6 7 DESCRIPTION	SOURCE CODE	REPAIR CODE	UNITS PER ASSEMBLY	USABLE ON CODE
1-	74-3-0-1	INDICATOR, Exhaust Gas Temperature	P1	D	1	
-1	74-3-3-6	. COVER	X2	B	1	
		(ATTACHING PARTS)				
	MS51861-22	. SCREW	P1	S	4	
		---*---				
-2	74-3-3-3	. BOTTOM	X2	B	1	
		(ATTACHING PARTS)				
	MS51861	. SCREW	P1	S	6	
		---*---				
-3	MS3102E10SL4P	. CONNECTOR	P1	S	1	
		(ATTACHING PARTS)				
	MS35206-215	. SCREW	P1	S	4	
	MS35338-40	. WASHER, Lock	P1	S	4	
	MS35649-242	. NUT	P1	S	4	
		---*---				
-4	MS3102E14S7P	. CONNECTOR	P1	S	1	
		(ATTACHING PARTS)				
	MS35206-215	. SCREW	P1	S	4	
	MS35338-40	. WASHER, Lock	P1	S	4	
	MS35649-242	. NUT	P1	S	4	
		---*---				
-5	74-3-3-5	. TOP	X2	B	1	
		(ATTACHING PARTS)				
	MS51861-22	. SCREW	P1	S	6	
		---*---				
-6	73-3-3-4	. BACK	X2	B	1	
		(ATTACHING PARTS)				
	MS51861-22	. SCREW	P1	S	4	
		---*---				
-7	SP325-4	. NAMEPLATE	M	F	1	
-8	74-3-3-1	. SIDE	X2	B	1	
-9	74-3-3-2	. SIDE	X2	B	1	
-10	HKP	. HOLDER, Fuse (71400)	P1	S	1	
-11	MDL1-4	. FUSE (71400)	P1	S	1	
-12	33-276	. POST, Duel Binding (72653)	P1	S	1	
-13	MS35058-22	. SWITCH	P1	S	2	
-14	58-26-316-56	. SCREW (94222)	P1	S	2	
-15	58-42-3-24	. RETAINER (94222)	P1	S	2	
-16	74-3-7-1	. INDICATOR, Thermocouple Type K (See Figure 2 for breakdown)	A	F	1	
		(ATTACHING PARTS)				
	MS35206-228	. SCREW	P1	S	4	
		---*---				
-17	74-3-2-1	. FACE PLATE, EGT Indicator	X2	B	1	
		(ATTACHING PARTS)				
	MS35206-228	. SCREW	P1	S	6	
	MS35338-41	. WASHER, Lock	P1	S	6	
	MS35649-262	. NUT	P1	S	6	
		---*---				
-18	74-3-0-2	. NAMEPLATE	M	F	1	
-19	MS25201-4	. SWITCH, Toggle			1	

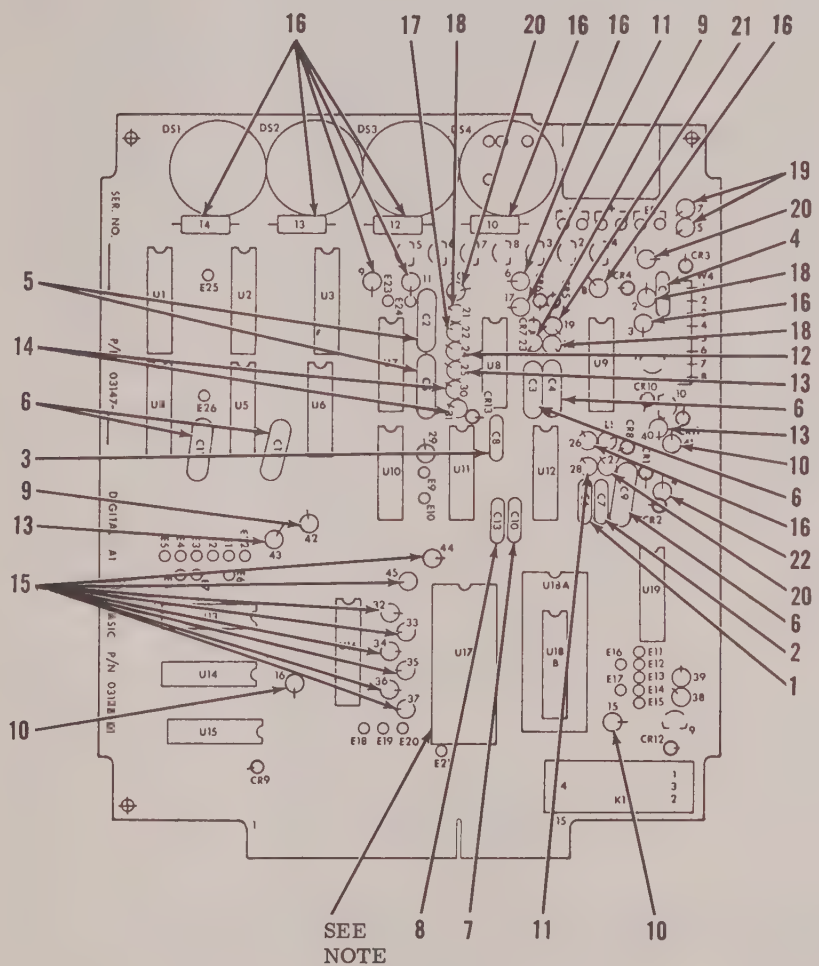




VIEW A-A

Figure 8-2. Thermocouple Type K Indicator.

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	Source Code	Repair Code	UNITS PER ASSY	USABLE ON CODE
2-	74-3-7-1	INDICATOR, Thermocouple Type K (See Figure 1 for next higher assembly)	A	F	REF	
-1	74-3-7-2	. LENS	M	F	1	
-2	78SR10	. POTENTIOMETER (32997)	P1	S	1	
-3	78SR1K	. POTENTIOMETER (32997)	P1	S	1	
-4	74-3-7-3	. CABLE ASSY, 20 ANG, 3 COND	M	F	2	
	74-3-8-1	. INDICATOR, Digital,	P1	D	1	
-5	74-3-9-1	. . CASE, Upper	X2	B	1	
-6	74-3-9-2	. . CASE, Lower	X2	B	1	
-7	74-3-9-3	. . PLATE, Rear Enclosure	X2	B	1	
		(ATTACHING PARTS)				
	MS35206-228	. . SCREW	P1	S	4	
		---*---				
-8	74-3-10-3	. . BOARD ASSY, Digital PC (See Figure 3 for Details)	P1	D	1	
-9	74-3-10-2	. . BOARD ASSY, Analog PC (See Figure 4 for Details)	P1	D	1	
	74-3-10-2	. . BOARD ASSY, Analog 3 Digit Temp. Meter (For use on serial Nos. 015 and subsequent) (See Figure 5 for Details)	P1	L		
-10	74-3-10-4	. . CABLE, Ribbon	P1	S	1	
-11	74-3-11-1	. . BOARD, Insulator	M	F	1	
-12	74-3-11-2	. . BOARD, Insulator	M	F	1	
-13	6024-04	. . CLAMP, Cable (81073)	P1	S	1	
-14	SCD10639	. . CONNECTOR	P1	S	1	
		(ATTACHING PARTS)				
	74-3-11-3	. . SPACER	M	F	2	
	MS35333-36	. . WASHER	P1	S	2	
	MS35649-242	. . NUT	P1	S	2	
		---*---				
-15	501	. . LUG, Solder type (79963)	P1	S	2	
-16	MS35338-41	. . WASHER	P1	S	4	
-17	MS35649-262	. . NUT	P1	S	4	



NOTE:
ACCESSORY COMPONENT NOT USED
ON THIS MODEL.

Figure 8-3. Digital P. C. Board Assembly (Sheet 1 of 2).

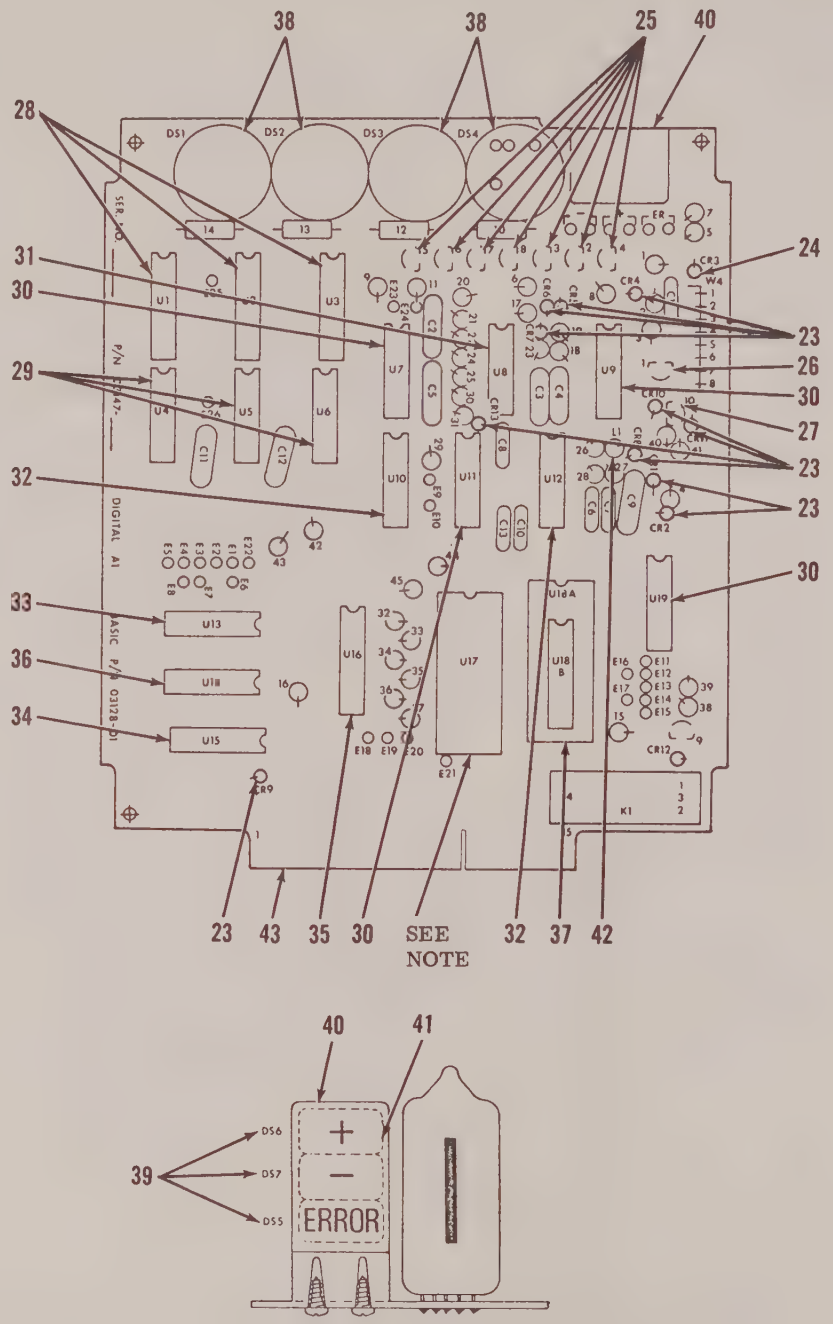


Figure 8-3. Digital P. C. Board Assembly (Sheet 2 of 2).

FIGURE AND INDEX NUMBER	PART NUMBER	1 2 3 4 5 6 7 DESCRIPTION	SOURCE CODE	REPAIR CODE	UNITS PER ASSEMBLY	USABLE ON CODE
3-	74-3-10-3	BOARD ASSY, Digital PC (See Figure 2 for next higher assembly)			REF	
-1	C023B102E330M	. CAPACITOR, 33PF ± 20%, 1KV (56289)	P1	S	1	
-2	C023B102E221M	. CAPACITOR, 220PF ± 10%, 1KV (56289)	P1	S	1	
-3	C023B102E681M	. CAPACITOR, 680 PF ± 10%, 1KV (56289)	P1	S	1	
-4	C023B102G332M	. CAPACITOR, 3300 PF ± 20%, 1KV (56289)	P1	S	1	
-5	C280AEA10K	. CAPACITOR, .01UF ± 10%, 250V (34553)	P1	S	2	
-6	C280AEA100K	. CAPACITOR, .1UF ± 10%, 250V (34553)	P1	S	5	
-7	C023B102E152M	. CAPACITOR, 1500PF ± 20%, 1KV (56289)	P1	S	1	
-8	CO23B102E471M	. CAPACITOR, 470PF ± 20%, 1KV (56289)	P1	S	1	
-9	1-2-10P470ET *1	. RESISTOR, 470 ± 10%, 1/2W (34553)	P1	S	2	
-10	1-2-10P680ET *1	. RESISTOR, 680 ± 10%, 1/2W (34553)	P1	S	3	
-11	1-2-10P1KT *1	. RESISTOR, 1K ± 10%, 1/2W (34553)	P1	S	2	
-12	1-2-10P1K5T *1	. RESISTOR, 1.5K ± 10%, 1/2W (34553)	P1	S	1	
-13	1-2-10P2K2T *1	. RESISTOR, 2.2K ± 10%, 1/2W (34553)	P1	S	3	
-14	1-2-10P4K7T *1	. RESISTOR, 4.7K ± 10%, 1/2W (34553)	P1	S	2	
-15	1-2-10P6K8T *1	. RESISTOR, 6.8K ± 10%, 1/2W (34553	P1	S	8	
-16	1-2-10P18Kt *1	. RESISTOR, 18K ± 10%, 1/2W (34553)	P1	S	11	
-17	1-2-10P22KT *1	. RESISTOR, 22K ± 10%, 1/2W (34553)	P1	S	1	
-18	1-2-10P47KT *1	. RESISTOR, 47K ± 10%, 1/2W (34553)	P1	S	3	
-19	1-2-10P68LT *1	. RESISTOR, 68R ± 10%, 1/2W (34553)	P1	S	2	
-20	1-2-10P100KT *1	. RESISTOR, 100K ± 10%, 1/2W (34553)	P1	S	3	
-21	1-2-10P6M8T *1	. RESISTOR, 6.8 MEG ± 10%, 1/2W (34553)	P1	S	1	
-22	1-2-10P150KT *1	. RESISTOR, 150K ± 10%, 1/2W, (34553)	P1	S	1	
-23	1N4448	. DIODE, SW (13715)	P1	S	11	
-24	1N4004	. DIODE, Rectifier (01295)	P1	S	1	
-25	MPS5551M	. TRANSISTOR, NPN (13715)	P1	S	7	
-26	2N5961	. TRANSISTOR, NPN (13715)	P1	S	1	
-27	2N5224	. TRANSISTOR, NPN (13715)	P1	S	1	
-28	U6A744159X	. DECODER DRIVER (13715)	P1	S	3	
-29	DMSN7470	. DECADE COUNTER (27014)	P1	S	3	
-30	U6A747359X	. FLIP/FLOP (13715)	P1	S	4	
-31	U6A993659X	. HEX INVERTER (13715)	P1	S	1	
-32	9946	. INPUT NAND, Quad -2 (07263)	P1	S	2	
-33	U6A996259X	. INPUT NAND, Triple -3 (13715)	P1	S	1	
-34	U6A749359X	. BINARY COUNTER, 4 Bit (13715)	P1	S	1	
-35	SN7497N	. RATE MULTIPLIER, 6 Bit Binary (01295)	P1	S	1	
-36	LPTTULSS1-9L00	. INPUT NAND, Quad -2, Low Power (13715)	P1	S	1	
-37	MM5221	. ROM (27014)	P1	S	1	
-38	ZM1000	. TUBE, NIXIE (34553)	P1	S	4	
-39	3AH	. LAMP, Neon (08806)	P1	S	3	
-40	01918	. BLOCK, Legend (04984)	M	F	1	
		(ATTACHING PARTS)	M	F		
	MS24649-10	. SCREW	P1	S	2	
		---*---				
-41	02543	. FILM, Legend	M	F	1	
-42	1537-92	. INDUCTOR, 220 UH (99800)	P1	S	1	
-43	03131-01B	. BOARD, Printed Wiring (04984)	X2	S	1	
	*1	Suffix "T" in Part Number (s) indicate method of Packaging. Three (3) methods are available as listed below: T - Tape, (1,000 Resistors per tape) B - Bulk, (100 Resistors per pack) C - Card, (50 Resistors per card)				

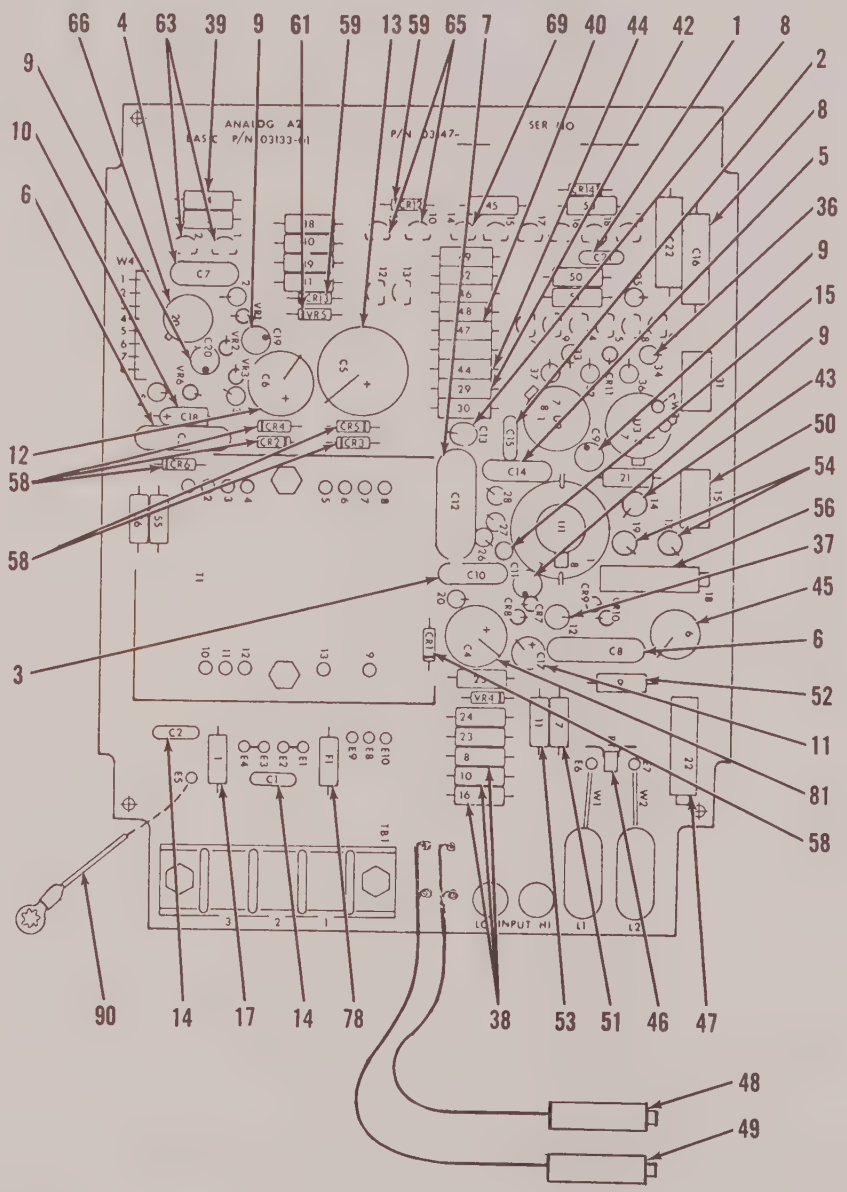


Figure 8-4. Analog P.C. Board Assembly (Sheet 1 of 2).

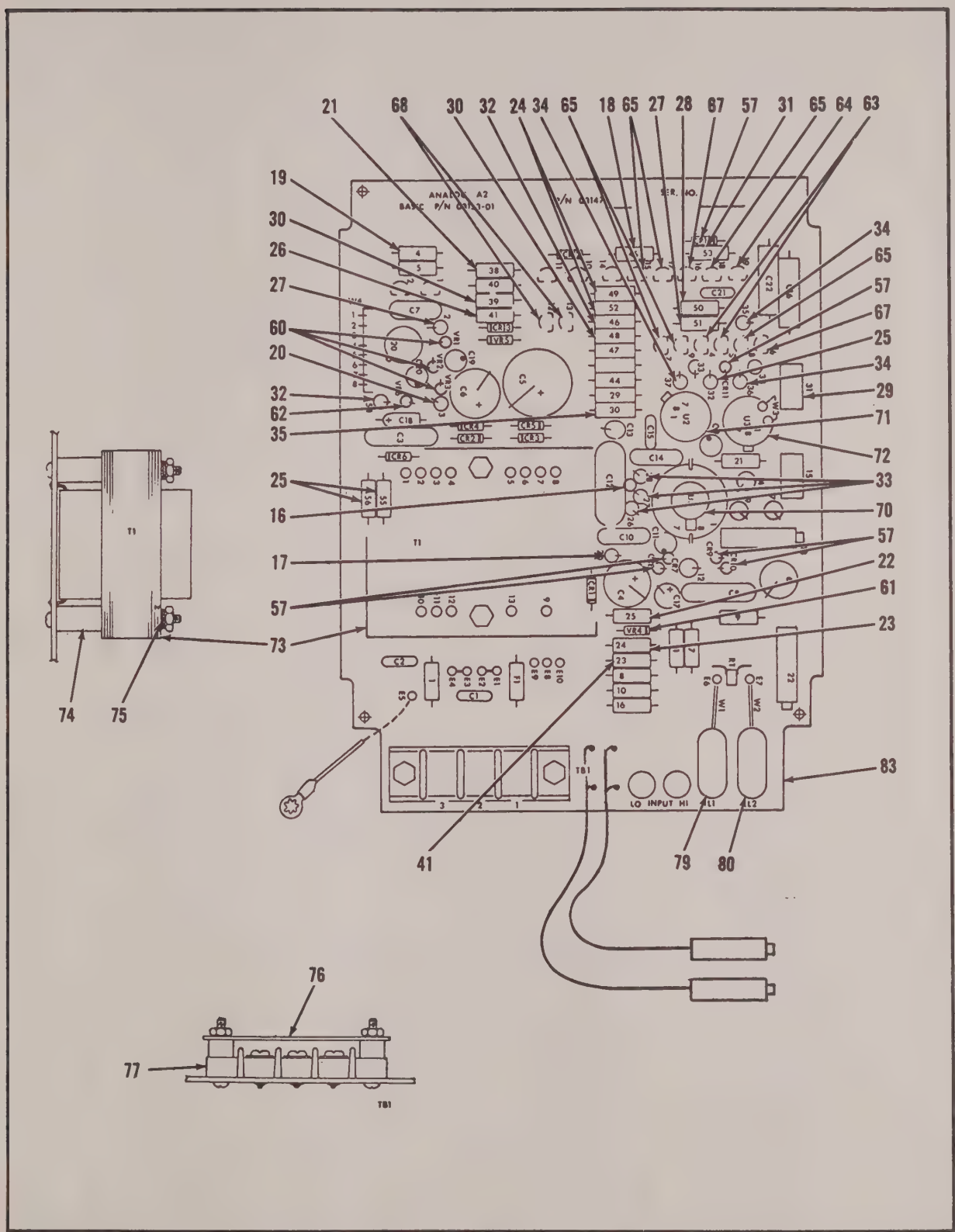


Figure 8-4. Analog P.C. Board Assembly (Sheet 2 of 2).

FIGURE AND INDEX NUMBER	PART NUMBER		1 2 3 4 5 6 7 DESCRIPTION	SOURCE CODE	REPAIR CODE	UNITS PER ASSEMBLY	USABLE ON CODE
4-	74-3-10-2		BOARD ASSEMBLY, Analog PC (See Figure 2 for next higher assembly)	X2	S	REF	
-1	C023B102E100M		. CAPACITOR, 10PF ± 20%, 1KV (56289)	P1	S	1	
-2	C023B102E330M		. CAPACITOR, 33PF ± 20%, 1KV (56289)	P1	S	1	
-3	210B1B473K		. CAPACITOR, .047UF ± 10%, 100V (14752)	P1	S	1	
-4	C280AEA22K		. CAPACITOR, .022UF ± 10%, 100V (34553)	P1	S	1	
-5	C280AEA68K		. CAPACITOR, .68UF ± 10%, 250V (34553)	P1	S	1	
-6	C280CFA100K		. CAPACITOR, .1UF ± 10%, 400V (34553)	P1	S	2	
-7	C280AEA390K		. CAPACITOR, .39UF ± 10%, 250V (34553)	P1	S	1	
-8	625B1A105K		. CAPACITOR, 1UF ± 10%, 50V (14752)	P1	S	2	
-9	25VTAG		. CAPACITOR, 1UF + 50-20%, 25V (15238)	P1	S	4	
-10	K1C35		. CAPACITOR, 1UF, 35V (05397)	P1	S	1	
-11	C426ARH10		. CAPACITOR, 10UF, + 50, -10%, 64V (34553)	P1	S	1	
-12	C437ARH100		. CAPACITOR, 100UF + 50, -10%, 64V (34553)	P1	S	2	
-13	C437ARE1500		. CAPACITOR, 1500UF + 50, -10%, 16V (34553)	P1	S	1	
-14	C023B102G332M		. CAPACITOR, 3300PF ± 20%, 1KV (56289)	P1	S	2	
-15	210B1C233K		. CAPACITOR, .022UF ± 10%, 200V (14752)	P1	S	1	
-16	1-2-10P30ET	*1	. RESISTOR, 39 ± 10%, 1/2W (34553)	P1	S	1	
-17	1-2-10P10ET	*1	. RESISTOR, 10 ± 10%, 1/2 W (34553)	P1	S	2	
-18	1-2-10P47ET	*1	. RESISTOR, 47 ± 10%, 1/2W (34553)	P1	S	1	
-19	1-2-10P820ET	*1	. RESISTOR, 820 ± 10%, 1/2W (34553)	P1	S	1	
-20	1-2-10P120ET	*1	. RESISTOR, 120 ± 10%, 1/2W (34553)	P1	S	1	
-21	1-2-P1K5T	*1	. RESISTOR, 1.5K ± 10%, 1/2W (34553)	P1	S	1	
-22	1-2-10P2K2T	*1	. RESISTOR, 2.2K ± 10%, 1/2W (34553)	P1	S	2	
-23	1-3-10P1K8T	*1	. RESISTOR, 1.8K ± 10%, 1/2W (34553)	P1	S	1	
-24	1-2-10P3K9T	*1	. RESISTOR, 3.9K ± 10%, 1/2W (34553)	P1	S	2	
-25	1-2-10P4K7T	*1	. RESISTOR, 4.7K ± 10%, 1/2W (34553)	P1	S	4	
-26	1-2-10P6K8T	*1	. RESISTOR, 6.8K ± 10%, 1/2W (34553)	P1	S	1	
-27	1-2-10P12KT	*1	. RESISTOR, 12K ± 10%, 1/2W (34553)	P1	S	2	
-28	1-2-10P15KT	*1	. RESISTOR, 15K ± 10%, 1/2W (34553)	P1	S	1	
-29	72XW10K	*1	. RESISTOR, Variable 10K (73138)	P1	S	1	
-30	1-2-10P27KT	*1	. RESISTOR, 27K ± 10%, 1/2W, (34553)	P1	S	2	
-31	1-2-10P33KT	*1	. RESISTOR, 33K ± 10%, 1/2W (34553)	P1	S	1	
-32	1-2-10P39KT	*1	. RESISTOR, 39K ± 10%, 1/2W (34553)	P1	S	2	
-33	1-2-10P110KT	*1	. RESISOTR, 110K ± 10%, 1/2W (34553)	P1	S	3	
-34	1-2-10P220KT	*1	. RESISTOR, 220K ± 10%, 1/2W (34553)	P1	S	3	
-35	1-2-10P330KT	*1	. RESISTOR, 330K ± 10%, 1/2W (34553)	P1	S	1	
-36	1-2-10P1MT	*1	. RESISTOR, 1 MEG ± 10%, 1/2W (34553)	P1	S	1	
-37	MF5CE1009F		. RESISTOR, 100 ± 1%, ± 25 PPM (19701)	P1	S	1	
-38	MF5CD2000F		. RESISTOR, 200 ± 1% (19701)	P1	S	3	
-39	MF5CD5620F		. RESISTOR, 562 ± 1% (19701)	P1	S	1	
-40	MF5CD1871F		. RESISTOR, 1.87K ± 1% (19701)	P1	S	1	
-41	MF5CD4991F		. RESISTOR, 4.99K ± 1% (19701)	P1	S	1	
-42	MF5CD6041F		. RESISTOR, 6.04K ± 1% (19701)	P1	S	1	
-43	MF5CD9091F		. RESISTOR, 9.09K ± 1% (19701)	P1	S	1	
-44	MF5CD1212F		. RESISTOR, 12.1K ± 1% ± 25 PPM (19701)	P1	S	1	
-45	TR5		. RESISTOR, 10K ± 3%, 5W (01686)	P1	S	1	
-46	JB31J2		. THERMISTOR (15801)	P1	S	1	
-47	89PR2K		. RESISTOR, Variable, 2K (73138)	P1	S	1	
-48	78SR10		. RESISTOR, Variable, 10 (73138)	P1	S	1	
-49	78SR1K		. RESISTOR, Variable, 1K (73138)	P1	S	1	
-50	72XW2K		. RESISTOR, Variable, 2K (73138)	P1	S	1	
-51	MF5CD1309F		. RESISTOR, 130 ± 1%, 1/8W (19701)	P1	S	1	
-52	MF5CD8259F		. RESISTOR, 825 ± 1%, 1/8W (19701)	P1	S	1	
-53	MF5CD6988F		. RESISTOR, 69.8 ± 1%, 1/8W (19701)	P1	S	1	
-54	MF5CD2492F		. RESISTOR, 24.9K ± 1%, 1/8W (19701)	P1	S	2	
-55	MF5CD8061F		. RESISTOR, 8.06K ± 1%, 1/8 W (19701)	P1	S	1	
-56	89PR50K		. RESISTOR, Variable 50K (73138)	P1	S	1	
-57	1N4448		. DIODE, WS	P1	S	6	

FIGURE AND INDEX NUMBER	PART NUMBER	1 2 3 4 5 6 7 DESCRIPTION	SOURCE CODE	REPAIR CODE	UNITS PER ASSEMBLY	USABLE ON CODE
-58	1N4004	. DIODE, Rectifier (01295)	P1	S	6	
-59	47008	. DIODE, SW	P1	S	2	
-60	1N759A	. DIODE, Zener, 12V (13715)	P1	S	3	
-61	1N825	. DIODE, Zener, 6.2V (04713)	P1	S	2	
-62	1N748A	. DIODE, Zener, 3.9V (13715)	P1	S	1	
-63	2N5961	. TRANSISTOR, NPN, (13715)	P1	S	4	
-64	2N5224	. TRANSISTOR, NPN, (13715)	P1	S	1	
-65	2N5961	. TRANSISTOR, NPN, (13715)	P1	S	8	
-66	2N4030	. TRANSISTOR, PNP, (07263)	P1	S	1	
-67	2N5086	. TRANSISTOR, PNP (07263)	P1	S	2	
-68	2N5086	. TRANSISTOR, PNP (07263)	P1	S	2	
-69	2N5457	. TRANSISTOR, FET (04713)	P1	S	1	
-70	J5B7725393	. OP/AMP (13715)	P1	S	1	
-71	LM301A	. OP/AMP (27014)	P1	S	1	
-72	U5B774139X	. OP/AMP (13715)	P1	S	1	
-73	48036	. TRANSFORMER	P1	S	1	
		(ATTACHING PARTS)	P1	S		
	MS35260-325	. SCREW	P1	S	2	
	MS35335-29	. WASHER, Lock	P1	S	4	
	MS20341-4S	. NUT	P1	S	2	
		---*---				
-74	9103006	. SPACER, 1/4 OD x 1/8 ID x 1/2 Lg., Al	M	F	2	
-75	AN960-4	. WASHER, Flat	P1	S	4	
-76	03150	. COVER, TB1	M	F	1	
		(ATTACHING PARTS)	M	F		
	MS20341-4S	. NUT	M	F	2	
		---*---				
-77	599-2021-3	. TERMINAL BLOCK (75382)	X2	S	1	
		(ATTACHING PARTS)	X2	S		
	9103088	. SPACER, Threaded 4-40NF, 1/4OD x 3/16Lg. Al	P1	S	2	
	MS35206-219	. SCREW	P1	S	2	
		---*---				
-78	275-250	. FUSE (75915)	P1	S	1	
-79	9101717	. LUG, Thermocouple (Al)	X2	S	1	
-80	9101716	. LUG, Thermocouple (CR)	X2	S	2	
-81	MS51859-3	. WASHER, Nylon	P1	S	2	
-82	MS51859-6	. WASHER, Nylon	P1	S	1	
-83	03136-01B	. BOARD, Printed Wiring	X2	S	1	

*1 Suffix "T" in Part Number(s) indicate method of packaging. Three(3) methods are available as listed below:

T - Tape, (1,000 Resistors per tape)
B - Bulk, (100 Resistors per pack)
C - Card, (50 Resistors per card)

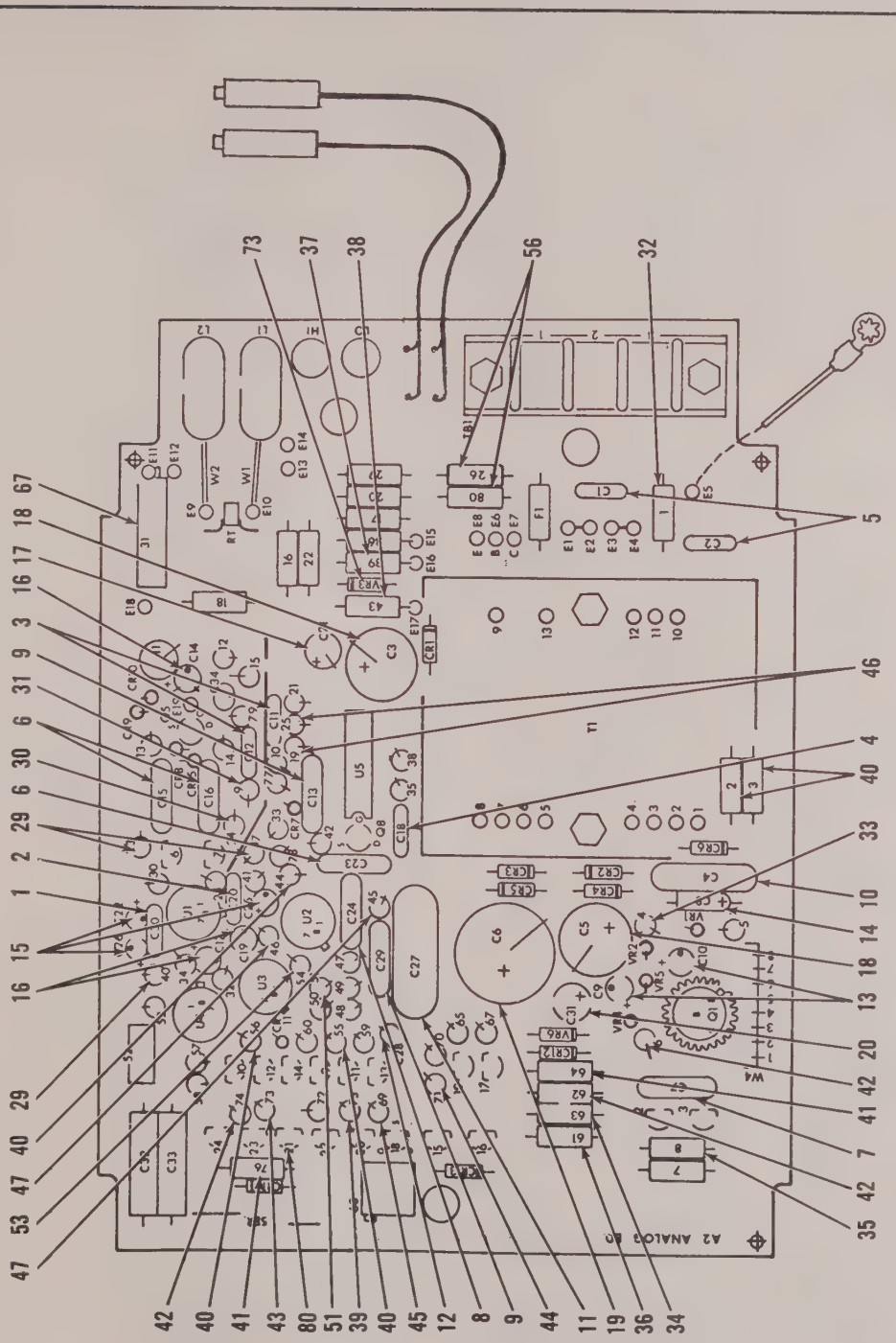


Figure 8-5 Board Assembly, Analog 3 Digit Temp. Meter (for serial Nos. 015 and subsequent) Sheet 1 of 3

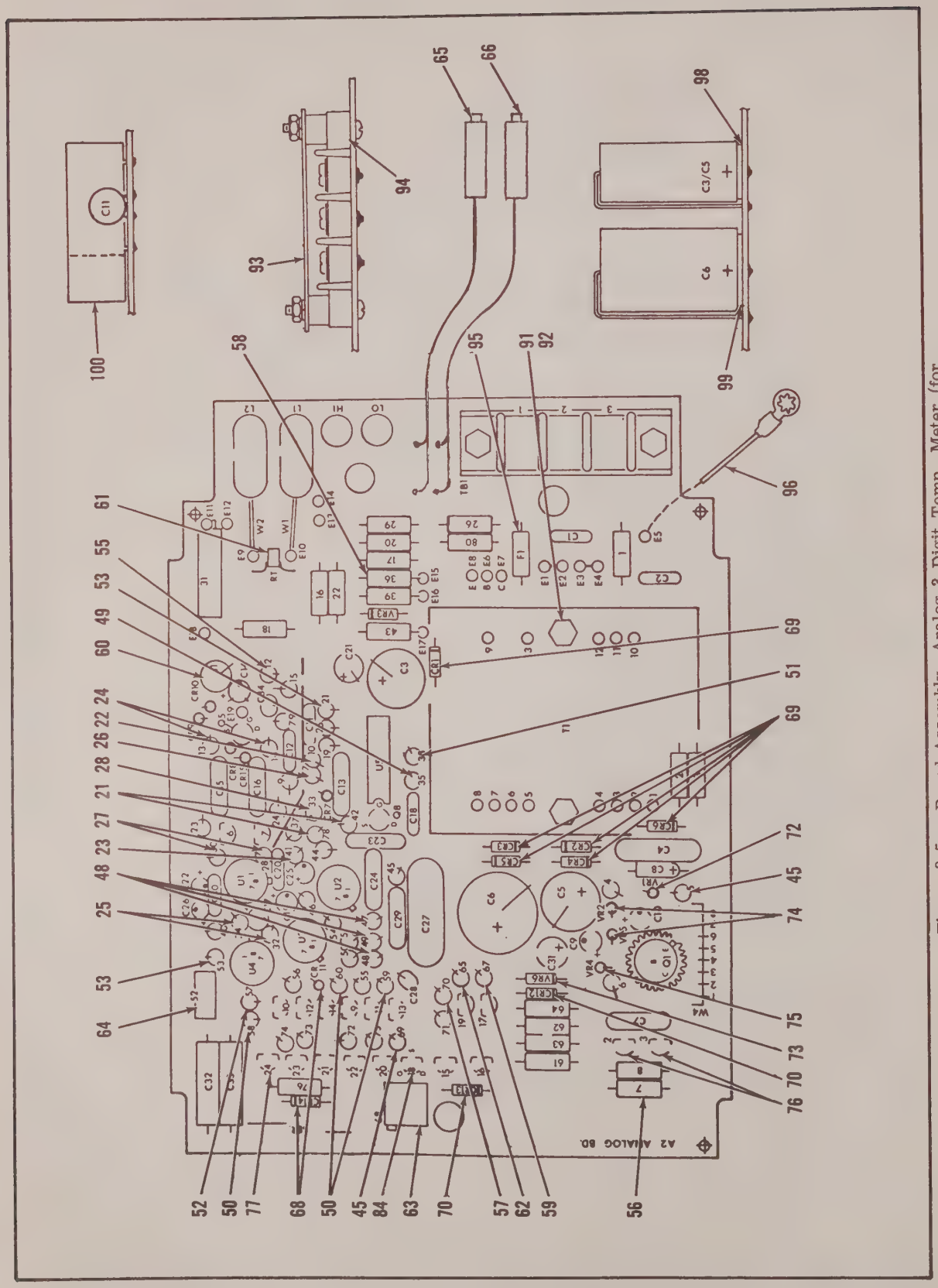


Figure 8-5 Board Assembly, Analog 3 Digit Temp. Meter (for serial Nos. 015 and subsequent) Sheet 2 of 3

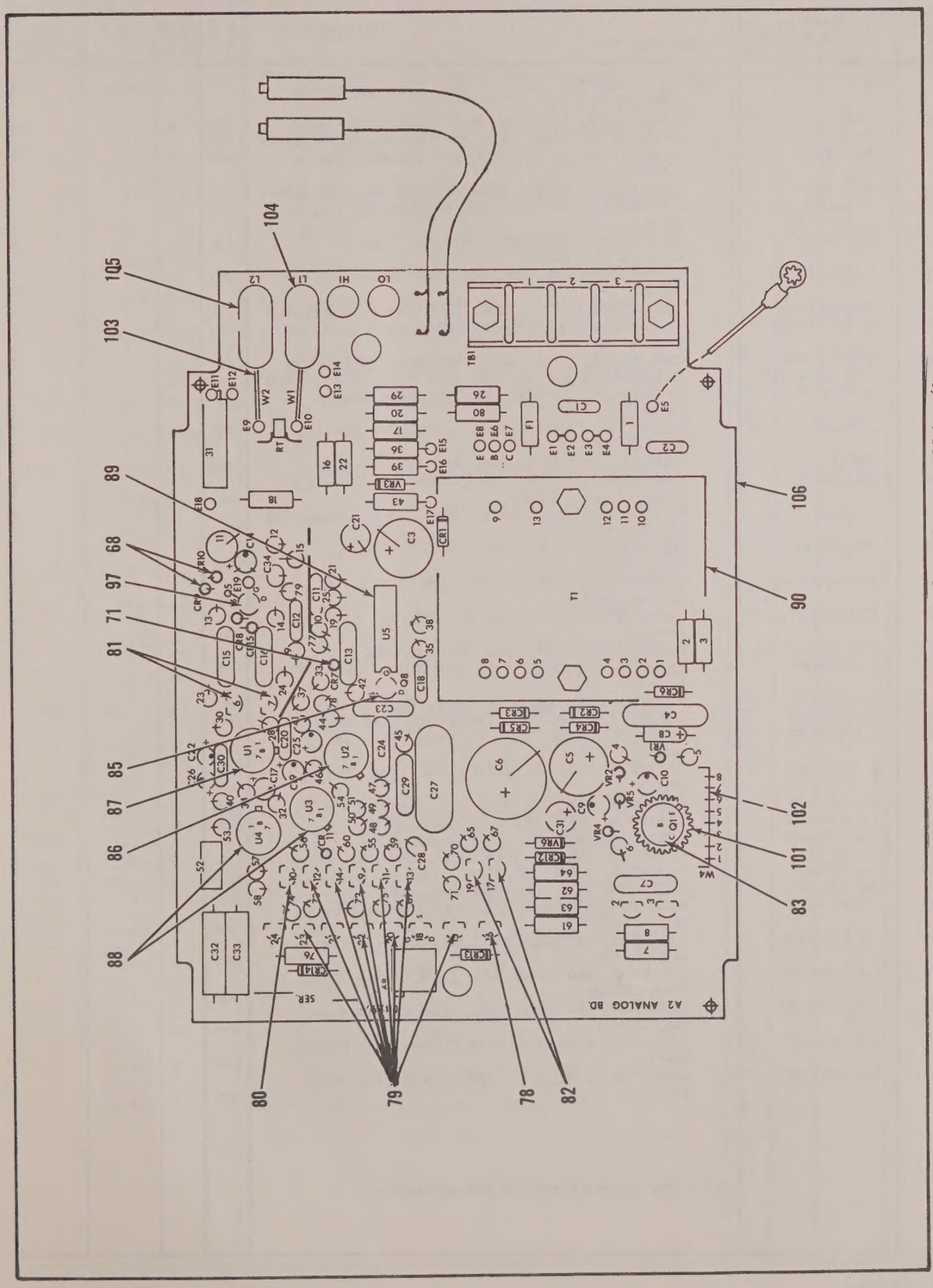


Figure 8-5 Board Assembly, Analog 3 Digit Temp. Meter (for serial Nos. 015 and subsequent) Sheet 3 of 3

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	Source Code	Repair Code	UNITS PER ASSY	USABLE ON CODE
5-	74-3-10-2	*BOARD ASSEMBLY, Analog 3 Digit Temp Meter (For NHA See Fig. 2)	P1	L	REF	
-1	CM05-020	. CAPACITOR, 2PF, 5%, 500V MICA (C30) (53021)	PD	S	1	
-2	5GA-Q22	. CAPACITOR, 22PF, 20%, 1KV Ceramic (C20) (56289)	PD	S	1	
-3	5GA-T33	. CAPACITOR, 330PF, 20%, 1KV Ceramic (C11, 12) (56289)	PD	S	2	
-4	5GA-T22	. CAPACITOR, 220PF, 20%, 1KV Ceramic (C18) (56289)	PD	S	1	
-5	5GA-D33	. CAPACITOR, 3300PF, 20%, 1KV Ceramic (C1, 2) (56289)	PD	S	2	
-6	75F1R1C222	. CAPACITOR, .0022UF, 10%, 100V Mylar (C15, 16, 23) (06001)	PD	S	3	
-7	C280AE/A2K2	. CAPACITOR, .0022UF, 10%, 250V Mylar (C7) (34553)	PD	S	1	
-8	C280AE/A3K3	. CAPACITOR, 033UF, 10%, 250V Mylar (C24) (34553)	PD	S	1	
-9	C280AE/A68K	. CAPACITOR, .068UF, 10%, 250V Mylar (C13, 29) (34553)	PD	S	2	
-10	C280CF/P100K	. CAPACITOR, .1UF, 10%, 400V Mylar (C4) (34553)	PD	S	1	
-11	C280AE/A390K	. CAPACITOR, .39UF, 10%, 250V Mylar (C27) (34553)	PD	S	1	
-12	625B1A105	. CAPACITOR, 1.0UF, 10%, 50V Palycarb (28, 32) (14752)	PD	S	2	
-13	25VTAG	. CAPACITOR, 1.0UF, +50%, -20%, 25V Tantalum (C9, 10) (15238)	PD	S	2	
-14	K1C35	. CAPACITOR, 1.0UF, 20%, 35V Tantalum (C8)	PD	S	1	
-15	TAG16V-3	. CAPACITOR, 4.7UF, +50%, -20%, 16V Tantalum (C22, 25, 26) (15238)	PD	S	3	
-16	TAG16V-5	. CAPACITOR, 10UF, +50%, -20%, 16V Tantalum (C14, 17, 19) (15238)	PD	S	3	
-17	ET100X06343	. CAPACITOR, 10UF, +50%, -10%, 64V Elect. (C21) (14752)	PD	S	1	
-18	C437-AR-G-100	. CAPACITOR, 100UF, +50%, -10%, 64V Elect. (C3, 5) (34553)	PD	S	2	
-19	C437-AR-E-1500	. CAPACITOR, 1500UF, +50%, -10%, 16V Elect. (C6) (34553)	PD	S	1	
-20	T36-D686-015AS	. CAPACITOR, 68UF, 20%, 15V Tantalum (C31)	PD	S	1	
-21	1-4-5P56ET	. RESISTOR, 56 OHMS, 5%, 1/4W Comp. (R42, 78) (34553)	PD	S	2	
-22	1-4-5P1KT	. RESISTOR, 1K, 5%, 1/4W Comp. (R10) (34553)	PD	S	1	
-23	1-4-5P3K3T	. RESISTOR, 3.3K, 5%, 1/4W Comp. (R41) (34553)	PD	S	1	
-24	1-4-5P4K7T	. RESISTOR, 4.7K, 5%, 1/4W Comp. (R13, 14) (34553)	PD	S	2	
-25	1-4-5P39KT	. RESISTOR, 39K, 5%, 1/4W Comp. (R32, 34) (34553)	PD	S	2	
-26	1-4-5P56KT	. RESISTOR, 56K, 5%, 1/4W Comp. (R77) (34553)	PD	S	1	
-27	1-4-5P100KT	. RESISTOR, 100K, 5%, 1/4W Comp. (R28, 30)	PD	S	2	
-28	1-4-5P180KT	. RESISTOR, 180K, 5%, 1/4W Comp. (R33)	PD	S	1	
-29	1-4-5P1MT	. RESISTOR, 1M, 5%, 1/4W Comp. (R23, 37, 40)	PD	S	3	
-30	1-4-5P2M2	. RESISTOR, 2.2M, 5%, 1/4W Comp. (R24)	PD	S	1	
-31	1-4-5P56M	. RESISTOR, 56M, 5%, 1/4W Comp. (R9)	PD	S	1	
-32	1-2-10P10ET	. RESISTOR, 10 OHMS, 10%, 1/2W Carbon Film (R1) (34553)	PD	S	1	
-33	1-2-10P82ET	. RESISTOR, 82 OHMS, 10%, 1/2W Carbon Film (R4) (34553)	PD	S	1	
-34	1-2-10P560ET	. RESISTOR, 560 OHMS, 10%, 1/2W Carbon Film (R63) (34553)	PD	S	1	
-35	1-2-10P820ET	. RESISTOR, 820 OHMS, 10%, 1/2W Carbon Film (R8) (34553)	PD	S	1	
-36	1-2-10P1K5T	. RESISTOR, 1.5K, 10%, 1/2W Carbon Film (R61) (34553)	PD	S	1	
-37	1-2-10P1K8T	. RESISTOR, 1.8K, 10%, 1/2W Carbon Film (R39) (34553)	PD	S	1	

*For use on serial Nos. 015 and subsequent

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	Source Code	Repair Code	UNITS PER ASSY	USABLE ON CODE
-38	1-2-10P2K2T	. RESISTOR, 2.2K, 10%, 1/2W Carbon Film (R43) (34553)	PD	S	1	
-39	1-2-10P3K9T	. RESISTOR, 3.9K, 10%, 1/2W Carbon Film (R72, 75) (34553)	PD	S	2	
-40	1-2-10P4K7T	. RESISTOR, 4.7K, 10%, 1/2W Carbon Film (R2, 3, 44, 55, 56) (34553)	PD	S	5	
-41	1-2-10P6K8T	. RESISTOR, 6.8K, 10%, 1/2W Carbon Film (R64, 76) (34553)	PD	S	2	
-42	1-2-10P12KT	. RESISTOR, 12K, 10%, 1/2W Carbon Film (R6, 62, 74) (34553)	PD	S	3	
-43	1-2-10P15KT	. RESISTOR, 15K, 10%, 1/2W Carbon Film (R73) (34553)	PD	S	1	
-44	1-2-10P27KT	. RESISTOR, 27K, 10%, 1/2W Carbon Film (R71) (34553)	PD	S	1	
-45	1-2-10P39KT	. RESISTOR, 39K, 10%, 1/2W Carbon Film (R5, 69) (34553)	PD	S	2	
-46	1-2-10P56KT	. RESISTOR, 56K, 10%, 1/2W Carbon Film (R19, 25) (34553)	PD	S	2	
-47	1-2-10P100KT	. RESISTOR, 100K, 10%, 1/2W Carbon Film (R45, 46) (34553)	PD	S	2	
-48	1-2-10P110KT	. RESISTOR, 110K, 10%, 1/2W Carbon Film (R47, 48, 49) (34553)	PD	S	3	
-49	1-2-10P150KT	. RESISTOR, 150K, 10%, 1/2W Carbon Film (R35) (34553)	PD	S	1	
-50	1-2-10P220KT	. RESISTOR, 220K, 10%, 1/2W Carbon Film (R58, 59, 60) (34553)	PD	S	3	
-51	1-2-10P330KT	. RESISTOR, 330K, 10%, 1/2W Carbon Film (R38, 51) (34553)	PD	S	2	
-52	1-2-10P1MT	. RESISTOR, 1M, 10%, 1/2W Carbon Film (R57) (34553)	PD	S	1	
-53	1-2-10P4M7	. RESISTOR, 4.7M, 10%, 1/2W Carbon Film (R21, 53, 54) (34553)	PD	S	3	
-54	MF5CD499OF	. RESISTOR, 4.99 OHMS, 1%, 1/8W Metal Film (R26, 80)	PD	S	2	
-55	MF5CE1009F	. RESISTOR, 100 OHMS, 1%, 1/8W Metal Film (R12)	PD	S	1	
-56	MF5CO5620F	. RESISTOR, 562 OHMS, 1%, 1/8W Metal Film (R7)	PD	S	1	
-57	MF5CD1871F	. RESISTOR, 1.87K, 1%, 1/8W Metal Film (R70)	PD	S	1	
-58	MF5CD4991F	. RESISTOR, 4.99K, 1%, 1/8W Metal Film (R36)	PD	S	1	
-59	MF5C-E-1212-F	. RESISTOR, 12.10K, 1%, 1/8W 25 PPM Metal Film (R67) (19701)	PD	S	1	
-60	TR5	. RESISTOR, 10K, 3%, 5W Wirewound (R11) (01686)	PD	S	1	
-61	JB31J2	. RESISTOR THERMISTOR (RT) (15801)	PD	S	1	
-62	No Number	. RESISTOR, (R65) Nominal Valve 500K	X1	S	1	
-63	66PR50	. RESISTOR, 50 OHMS, VAR (R68) (73138)	PD	S	1	
-64	72XWR100	. RESISTOR, 100K, VAR (R52) (73138)	PD	S	1	
-65	89PR200	. RESISTOR, 200 OHMS, VAR 89PR (R27) (80053)	PD	S	1	
-66	89PR1K	. RESISTOR, 1K, VAR 89PR (R66) (80053)	PD	S	1	
-67	89PR2K	. RESISTOR, 2K, VAR 89PR (R31) (80053)	PD	S	1	
-68	1N4448	. DIODE, SW (CR9, 10, 11, 14) (13715)	PD	S	4	
-69	1N4004	. DIODE RECTIFIER (CR1, 2, 3, 4, 5, 6) (13715)	PD	S	6	
-70	1N4448	. DIODE, SW (CR12, 13) (13715)	PD	S	2	
-71	HP5082-2833	. DIODE, HOT CARRIER (CR7)	PD	S	1	
-72	1N748A	. DIODE ZENER (VR1) (13715)	PD	S	1	
-73	1N825	. DIODE ZENER (VR3, 6) (04713)	PD	S	2	
-74	1N759A	. DIODE ZENER (VR2, 5) (13715)	PD	S	2	
-75	1N961B	. DIODE ZENER (VR4) (13715)	PD	S	1	
-76	2N5961	. TRANSISTOR, NPN (Q2, 3) (13715)	PD	S	2	
-77	2N5224	. TRANSISTOR, NPN (Q24) (13715)	PD	S	1	
-78	2N3904	. TRANSISTOR, NPN (Q16) (13715)	PD	S	1	

FIG. & INDEX NO.	PART NO.	1 2 3 4 5 6 7 DESCRIPTION	Source Code	Repair Code	UNITS PER ASSY	USABLE ON CODE
-79	2N5961	. TRANSISTOR, NPN (Q9, 11, 12, 13, 14, 15, 20, 22, 23)	PD	S	9	
-80	2N5086	. TRANSISTOR, PNP (Q10, 21) (13715)	PD	S	2	
-81	SCD10650	. TRANSISTOR, PNP (Matched Pair) (Q6, 7)	PD	S	1	
-82	2N5086	. TRANSISTOR, PNP (Q17, 19)	PD	S	2	
-83	2N4030	. TRANSISTOR, PNP (Q1) (13715)	PD	S	1	
-84	2N5457	. TRANSISTOR, FET (Q18) (04713)	PD	S	1	
-85	U1994E	. TRANSISTOR, FET (Q8)	PD	S	1	
-86	U5B774139X	. OP/AMP (741) (U2) (13715)	PD	S	1	
-87	U5B770939X	. OP/AMP (709) (U1) (13715)	PD	S	1	
-88	1C776	. OP/AMP (776) (U3, 4) (13715)	PD	S	2	
-89	CD4007A	. INVERTER (U5)	PD	S	1	
-90	48036	. TRANSFORMER, Power (T1)	PD	S	1	
		(Attaching Parts)				
	MS35206-325	. SCREW 4-40X1 3/8 LG	P1	S	2	
	MS35335-29	. WASHER, Lock #4 Int. Tooth	P1	S	4	
		.				
		---*---				
-91	9103006	. SPACER, 1/2 LG	M-	S	2	
-92	AN960-4	. WASHER, Flat	P1	S	2	
-93	03150	. COVER, TB1	X2	S	1	
		(Attaching Parts)				
	MS20341-4S	. NUT, HEX #4 STD	P1	S	4	
		---*---				
-94	599-2021-3	. TERMINAL BLOCK (TB1) (75382)	X2	S	1	
		(Attaching Parts)				
	9103088	. SPACER, 3/16 LG THD (83330)	X2	S	2	
	MS35206-219	. SCREW, 4-40 X 3/4 LG PAN HEAD	P1	S	2	
		---*---				
-95	275.250	. FUSE, 1/4 AMP (F1) (75915)	P1	S	1	
-96	01641-02	. JUMPER, with GND LUG	M-	S	1	
-97	04237	. ASSEMBLY, TRANSISTOR (Q5)	P1	S	1	
-98	MS51859-3	. WASHER, Nylon 5/16 OD	P1	S	2	
-99	MS51859-6	. WASHER, Nylon 5/8 OD	P1	S	1	
-100	04236	. PLATE SHIELD	X2	S	1	
-101	3AL6635-2R	. HEAT SINK, T0-5 (For Q1)	PD	S	1	
-102	74-3-10-4	. CABLE, Flat 8 Cond. (W4)	X2	S	1	
-103	298	. JUMPER WIRE 22 AWG BOSS	P1	S	4	
-104	9101717	. LUG THERMOCOUPLE (L1)	PD	S	1	
-105	9101716	. LUG THERMOCOUPLE (L2)	PD	S	1	
-106	04253-01A	. BOARD PRINTED WIRING	X1	S	1	

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